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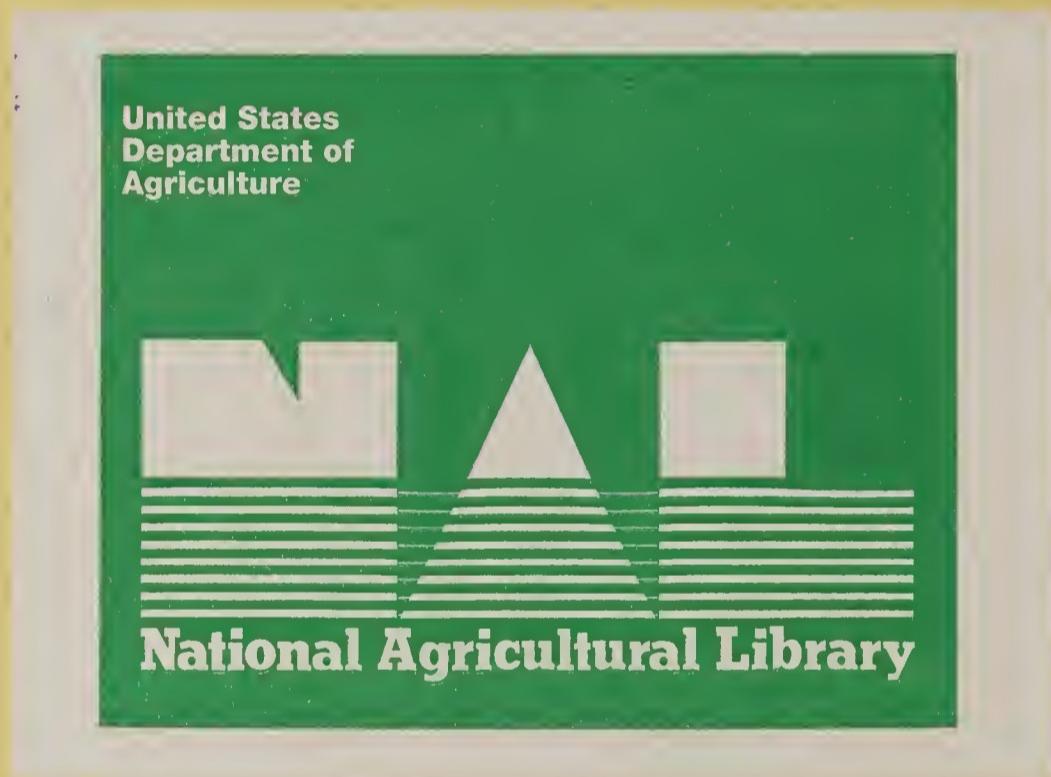
PB-297 863

A HISTORY OF USDA STANDARDIZATION AND INSPECTION
AND GRADING SERVICES OF MANUFACTURED DAIRY PRODUCTS

U.S. DEPARTMENT OF AGRICULTURE

JULY 1979

Agricultural and Rural History, ERS



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A History of USDA Standardization and Inspection and Grading Services of Manufactured Dairy Products

Edward Small

Food Safety and
Quality Service

U.S. Department
of Agriculture

Washington, D.C.

July 1979

U.S.D.A., NAL
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To Wayne Pasmussen -
my sincerest appreciation
for your cooperation
and assistance.
Ed Small

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REPORT DOCUMENTATION PAGE		1. REPORT NO.	2.	3. Recipient's Accession No.
				PB297863
4. Title and Subtitle		A History of USDA Standardization and Inspection and Grading Services of Manufactured Dairy Products		
7. Author(s)		Edward Small		
9. Performing Organization Name and Address		U.S. Department of Agriculture Food Safety and Quality Service 14th and Independence Avenue, S.W. Washington, D.C. 20250		
12. Sponsoring Organization Name and Address		U.S. Department of Agriculture Food Safety and Quality Service 14th and Independence Avenue, S.W. Washington, D.C. 20250		
15. Supplementary Notes				
16. Abstract (Limit: 200 words)		<p>The history of USDA standardization and inspection and grading service for dairy products began over 60 years ago. A nationwide USDA inspection and grading service for butter, based on official grade standards, was inaugurated May 28, 1919, at central markets on a fee basis, authorized by Congress October 1, 1918. Inspection of butter was expanded to shipping points on a resident basis in 1924, at which time a consumer-grade labeling program was launched. The service was gradually extended to other dairy products, including various cheeses and dry milk. Industry requested resident inspection and quality control service at individual manufacturing plants where complete laboratory service was available. A systematic plant survey program was instituted in the 1950's. A service laboratory was established in Chicago in 1941. Since the mid-1940's legislative authority for the standardization, inspection and grading activities has come from the Agricultural Marketing Act of 1946.</p>		
17. Document Analysis a. Descriptors		Butter, Cheeses, Dairies, Dairy Products, Evaluation, Food Analysis, Food Industry, Food Inspection, Food Processing, Marketing, Milk, Quality, Quality Assurance, Quality Control, Sampling, Specifications, Standards, Standardization.		
b. Identifiers/Open-Ended Terms		Dairy Products Grading, Dairy Products Grade Standards, Dairy Products Marketing, Dairy Products Regulations, Dairy Plant Specifications, Dry Milk.		
c. COSATI Field/Group 06-H, Biological and Medical Sciences--Food				
18. Availability Statement Available from: National Technical Information Service 5285 Pt. Royal Road, Springfield, VA Service 22161		19. Security Class (This Report) Unclassified		20. Security Class (This Page) Unclassified
				22. Price A15-A01

This Book is Dedicated to the
Service of the Dairy Farmer and the Dairy Industry
for the Public Welfare and to the Dairy Division
Personnel devoted to this Cause

PREFACE

This manuscript describes the dairy standardization, inspection and grading programs of the U.S. Department of Agriculture from their origins in 1919 through 1976. It also describes corollary actions and programs starting in 1897, and immediate forerunner activities commencing in 1914.

The original manuscript contained, in addition, the organizational structure of the dairy industry to enable the reader to realize a fuller understanding of the utilization of the Standardization and Inspection and Grading program by the dairy industry and its role in the orderly marketing of dairy products for the public welfare.

Because of a funding problem it has been essential to confine the manuscript to the parameters indicated in the opening paragraph. In this connection I feel compelled to offer my sincerest apologies to the many persons who have generously furnished information that has been excluded.

During the period 1919-1920 most of the projects of the Bureau of Markets, U.S. Department of Agriculture, were grouped into various divisions and the dairy and poultry activities were organized into the Dairy and Poultry Products Division. In the next 30 years the dairy standardization, inspection, and grading programs were part of eight different USDA agencies. The names and dates of the various agencies under which the programs of this historical study were carried out are shown in Appendix B.

The standardization and inspection and grading of dairy and poultry products was conducted within the Dairy and Poultry Products Division until July 1, 1951. At that time the dairy products program was assigned to the newly established Dairy Division, Production and Marketing Administration, and assumed Branch status. Similarly the poultry products activities were assigned to the Poultry Division, PMA, and successor organizations.

In the spring of 1977 the dairy products standardization and inspection and grading activities were transferred from the Dairy Division, Agricultural Marketing Service, to become the Poultry and Dairy Quality Division in the newly established Food Safety and Quality Service. H. Connor Kennett, Jr. was designated as Director and Joseph A. Rubis as Deputy Director for dairy programs.

The Food Safety and Quality Service was established on March 14, 1977, in accordance with Secretary's Memorandum No. 1914.

It is fitting and proper and accurate to lay claim that no program whether of a regulatory or service function has contributed as much toward quality improvement, stability and safety of dairy products as the Standardization, and Inspection and Grading program of USDA.

I retired from the Dairy Division, Agricultural Marketing Service, in 1963, after a career of 36 years in standardization, inspection and grading activities, almost all of that time spent in management and supervisory responsibilities. It was my good fortune to have had the opportunity and privilege to have worked

with every pioneer in this USDA organization but two. I also had the privilege of knowing and working with many of the outstanding leaders of the dairy industry which furthered my love and respect for this great industry. My interest in dairying started during World War I, as a member of the Boys Working Reserve, to help relieve the farm labor shortage, and has never ceased.

My growing interest in dairying led me to spend countless hours at the University of Illinois agricultural library during my college days and at the John Crerar Library in Chicago, when I first entered Government service in 1927. That historical interest was extended to my tours of duty at the Washington office in the thirties and again in the fifties and sixties.

In preparing this manuscript, it was necessary to lean heavily on the records and files of the Standardization Branch, Inspection and Grading Branch, and the Administrative Office of the Dairy Division. In addition, the research spread to the listings of the National Archives, and the National Agricultural Library, Beltsville, Maryland, its Washington, D.C., branch and the Law Branch of NAL.

Likewise, considerable correspondence was exchanged with hundreds of former and current employees of the Dairy Division; and with members of the Poultry Division, AMS, and representatives of the Dairy Division of State Departments of Agriculture. Many individuals had given of their time to answer patiently my questions. In some cases personal interviews were granted.

A study of this magnitude and complexity is not possible without the aid of a great many individuals and institutions.

Special acknowledgement is due Harold E. Meister who rendered constructive criticism and invaluable assistance throughout most of the study. Particular acknowledgement is also given to Joseph A. Rubis for reading the manuscript and offering thoughtful suggestions, and to Robert G. Semerad who read many portions of the manuscript and furnished recommended changes.

Grateful appreciation is expressed to: Edwin F. Garbe, George Fry, Richard Webber, Lyle R. Tweten, Roland S. Golden, William G. Bryan, Kenneth R. Olson, LeRoy C. Iverson, Harold K. Linden, Roy F. Hettke, Floyd E. Fenton, Ervin R. Bartle, Reuben H. Wilson, Claude L. Reiser, Donald P. Webber, Frank H. McCampbell, Robert W. March, Silvio Capponi, David R. Strobel, John C. Blum, Donald H. Williams, John F. Speer, Jr., John C. Flake, Harold F. Mohr, Frank J. Santo, Marcus A. McCarron, and Elizabeth M. Bayliss.

I also am greatly indebted to Helen Uhliberri, National Archives; G. Malcolm Trout, Historian, American Dairy Science Association; Melba M. Bruno, Kevin Keaney, Evelyn A. Brownlee, and Robert L. Birch, National Agricultural Library; and Spurgeon D. Terry, Mortimer Naftalin, John C. Gray, and Robert B. Jones, Law Branch of the NAL.

In addition, I am greatly indebted to Wayne D. Rasmussen for his guidance and to Vivian Wiser for reviewing the manuscript for historical accuracy and offering many suggestions for improving same in format and style; both are historians of the U.S. Department of Agriculture.

I want to express my appreciation to Carol Deditch for typing the draft copy of the manuscript and for typing the manuscript for publication.

Last but not least, I am extremely grateful for the patience exhibited by my wife Marie during the period devoted to this project.

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INTEREST IN DAIRY MARKETING
ACTIVITIES AND THE OFFICE OF MARKETS

During the latter part of the nineteenth century, the application of mechanical power to industry brought about a revolution in manufacturing processes which increased industrial production. At the same time there was concern about the development of American agriculture to keep pace. The amount of farm land was beginning to shrink.

The year 1890 has been accepted as marking the end of the open frontier. The passing of readily tillable land, by coincidence, was accompanied by a protracted period of drought and economic depression which lowered the standards of rural life. On the other hand, industrial prosperity returned rather quickly. Industry entered upon a new style of expansion, with increased efficiency and reduced production costs. Agriculture was not in a position to advance proportionally. There was much unrest among the rural population. Farmers were not receiving their fair share of the economic rewards. (56, p. 110).

As long as there was plenty of cheap fertile land, the farmer was able to raise his income by increasing his production to the extent that he was not vitally interested in the price he received per unit. But the days of cheap land soon disappeared. The farmer began to demand a better price for his products, particularly for his perishables. This gave rise to the need to pay more attention to marketing problems.

UNITED STATES INDUSTRIAL COMMISSION

Some interest was manifested in the solution of marketing problems at the dawn of the twentieth century. The United States Industrial Commission was established by an act of Congress of June 18, 1898, to study the distribution system of agricultural and non-agricultural products, and to recommend legislation to meet problems presented by agriculture, labor and capital.¹

The Commission collected considerable information in carrying out exhaustive studies, publishing its 19-volume report from 1900 to 1902. In volume 10, issued in 1901, testimony was reported at a hearing in Chicago, Ill., Aug. 11, 1899, before a Committee of the Commission, to the effect that this country at one time enjoyed a large export trade in dairy products, especially in cheese, and that the export market was virtually destroyed on account of shipments of "filled" cheese for the real product. In order to regain the export trade, it was suggested that export grades be established and that the Bureau of Animal Industry, U.S. Department of Agriculture (USDA) be authorized to inspect all dairy products intended for export, and to brand appropriately the individual packages of each shipment (106, pp. 236-237).

In Volume 19, which summarized the other 18 volumes, the Commission recommended inspection and grading of agricultural commodities.

COUNTRY LIFE COMMISSION

President Theodore Roosevelt was the first president in the industrial age to acquire a sympathetic understanding of modern farm problems. He recognized that the welfare of the whole community depended upon the welfare of the farmer. President Roosevelt started the movement for the betterment of country life by appointment of a Country Life Commission on Aug. 8, 1908. Hearings were held by the Commission in 30 places scattered over the United States. The Commissioners handed their Report to the President on Jan. 23, 1909 (44, p. 163).

The Report noted two primary deficiencies. One was the lack of a highly organized rural society. Generally, the farmers possessed no power compared to what the unions secured for the industrial worker or what the corporation and trade association secured for the industrialists. Many farmers realized their weakness in economic bargaining as disclosed in their replies to two questions circularized pertaining to marketing. One question was designed to ascertain whether the farmers thought they were satisfactorily organized to promote their mutual buying and selling interests. The second question was devised to determine whether the farmers thought they had received reasonable returns from the sale of their products. In both instances the response was generally negative (44, p. 165).

A second fundamental source of woes, according to the Report, was the lack of a proper kind of education. The schools, at that time, were held responsible for ineffective farming, lack of ideals, and the drift to town. A circularized question was designed to ascertain whether the farmers thought the schools were training boys and girls satisfactorily for life on the farm. The responses were predominantly unfavorable (44, pp. 165-166).

Recommendations were made to help in the problem areas.

OFFICE OF MARKETS

The United States Department of Agriculture, in the 19th and early 20th century, like most other agricultural institutions, was interested primarily in production. The problem of marketing farm products had been facing American agriculture for many years, but prior to 1911 it had not been met squarely by the Government of the United States or its agencies.

The farmers were concerned mainly with that part of the marketing process which occurs between the producer and the processor or manufacturer. While the farmers had been agitating for many years, for a fair market price for the products they sold, they had been unable by themselves to secure a hearing of their marketing grievances. The urban population was concerned with the entire procedure of marketing and distribution, following the commodity to the consumer, and thus there developed a high cost-of-living crusade. The high cost-of-living movement served as a medium for effecting a temporary combination that could wield sufficient pressure to produce action.

The Saturday Evening Post, in its issue of Aug. 6, 1910, published an article entitled, "The Farmer and the Cost of Living," by B.F. Yoakum, chairman of the executive committee of the St. Louis and San Francisco Railroad Company. The great expenses of marketing and distributing farm commodities, according to his analysis, were to be found at either end of the transportation system. He contended that the farmer might reduce expenses at his end by good roads, and that the consumer might reorganize the urban distribution system, to effect economies at the other end. According to Yoakum's statistics, 60 percent of the spread between producers' and consumers' prices for food was chargeable to the middleman. He criticized public men for contributing to the inefficiencies of the marketing and distributing system. This criticism of public men caused some stir in the Congress, and several bills were introduced in an effort to establish a bureau of markets in the Department of Agriculture. However, none of the bills were enacted into law (56, p. 128).

That continuing attention was given to the problem of marketing and distribution by Congress is evidenced by the following provision in the act making appropriations for the Department of Agriculture for the fiscal year ending June 30, 1913:

... that the Secretary of Agriculture is hereby directed to secure from the various branches of the department having authority to investigate such matters, reports relative to systems of marketing farm products, cooperative or otherwise, in practice in various sections of the United States, and of the demand for such products in various trade centers, and shall make such recommendations to Congress relative to further investigations of these questions and the dissemination of such information as he shall deem necessary.²

The instruction in the appropriation act resulted in the well-known Report No. 98 entitled, "Systems of Marketing Farm Products and Demand for Such Products at Trade Centers." This report was prepared in the USDA Bureau of Statistics, under the immediate supervision of George K. Holmes, statistical scientist, with the assistance and cooperation of experts and specialists from other branches of the department who had available data on the subject. The report recommended that a division of markets be established to investigate the subjects of grading and packing of products, the character of the container, and the question of weights and measures (51).

The appropriation act for the next fiscal year contained the provision:

... to enable the Secretary of Agriculture to acquire and to diffuse among the people of the United States useful information on subjects connected with the marketing and distribution of farm products, and for the employment of persons and means necessary in the City of Washington and elsewhere, there is hereby appropriated the sum of \$50,000, of which \$10,000 shall be immediately available.³

Immediate steps were taken to carry out the authorization of Congress concerning marketing work. All of the offices of the Department conducting work or responsible for work relating to marketing and distribution of agricultural products were called upon to prepare complete statements of the work in progress. On March 27, 1913, there was a conference of these workers presided over by the Secretary himself. This symposium disclosed an amount of work that was a surprise even to the workers who were engaged in various parts of it.⁴

Other conferences were held and the increased interest in marketing pointed up the need for a special agency within the Department to study markets and marketing. Such an agency was created by the Secretary on May 16, 1913; it was called the Office of Markets.

Competitive examinations were conducted to determine the capability of the various applicants for the position as chief; as a final test, those under consideration were given three hours in which to draw up an outline of their ideas as to how the new Office of Markets should operate. The approved plan was that submitted by Charles J. Brand, who had been with the Department since 1903 as a specialist in the cooperative handling and marketing of cotton.⁵ Brand shortly thereafter was appointed Chief of the Office of Markets.

Brand was anxious that investigations of the marketing of dairy products, in cooperation with the Minnesota and Wisconsin agricultural colleges and experiment stations, should proceed without undue delay, and on Mar. 2, 1914, the Civil Service Commission authorized the temporary appointment of a market specialist (cooperative dairying) on condition that the person appointed make application when the examination was announced.

John A. Vye was given the temporary appointment and reported for duty on Apr. 1, 1914.⁶ Vye was commissioned: (1) to study the methods used by cooperative creameries and other cooperative associations of dairy products in marketing their product in Minnesota and Wisconsin, with a view to improving their efficiency and economy; (2) to investigate the difficulties encountered in such activities in order to assist in eradicating or minimizing them wherever possible; and (3) to demonstrate the methods whereby dairy products would be marketed to the best advantage. However, in the fall of 1914, the project was discontinued indefinitely, and Vye's services were terminated.

Four months later Roy C. Potts was selected as the project leader for dairy products.⁷ Studies of various phases of marketing dairy products were soon undertaken. Staff members of the Dairy Project were assigned to conduct surveys of specific problem areas. The studies in some instances were handled in collaboration with or assisted by other dairy specialists of USDA, or in collaboration with University specialists. Some of these studies are reviewed below.

MANUFACTURE AND MARKETING OF CREAMERY BUTTER IN THE SOUTH

In the spring of 1915, a survey of the manufacture and marketing of creamery butter in the South was undertaken by Roy C. Potts, specialist in marketing dairy products, Office of Markets and Rural Organization, and William White, dairy manufacturing specialist, Dairy Division, Bureau of

Animal Industry. In this survey 52 of the larger cities and butter markets were visited and information obtained from over 250 butter distributors regarding the sources of supply, the cost and selling prices, the channels of trade through which butter of different grades was distributed, the facilities and cost of transportation, as well as storage and the demands and requirements of the markets (66).

Pasteurization of the cream in buttermaking was encouraged and recommendations were made regarding good manufacturing practices.

The survey of the southern butter markets revealed the fact that by far the larger portion of the creamery butter consumed in the South was produced in the dairy States of the North and Middlewest. Since large quantities of northern and western butter were consumed in the South, it appeared that markets could be obtained in the South for southern creamery butter, provided that the southern creameries were able to produce butter of equal quality and make regular weekly shipments to dealers at competitive prices.

Those assisting in the study besides the authors were Messrs. S.C. Thompson, T. Corneliuson, W.B. Liverance, and M.P.A. Sondergaard, dairy manufacturing specialists, and H.F. Meyer, assistant in marketing dairy products.

MARKETING CREAMERY BUTTER

Supplementing the survey on butter marketing in the South, Potts and Meyer in 1916 made a survey of the principal butter markets of the Midwest and Northeast (65).

In each market and section visited, information on creamery butter was secured regarding marketing facilities and methods of distribution, market requirements and the establishing of market grades, transportation, and cold storage facilities.

The survey and investigation relating to this study was conducted in over 50 cities. In each market visited, numerous samples of butter were inspected, and interviews were obtained with wholesale butter receivers, jobbers, brokers, managers of chain stores, retailers, restaurants and hotel proprietors, officials of produce exchanges, the official butter inspectors of the exchanges, managers of cold storage warehouses, and officials of transportation companies.

A frequent complaint made by dealers and distributors in the markets was a lack of uniformity of the butter produced by many creameries and, at certain seasons, an increasing quantity of inferior butter known as "undergrades." An inspection of the butter indicated that the inferior quality was often due to the use of cream of poor quality, and to some extent to faulty manufacturing methods.

The more common faults observed in the butter were soft, leaky, open body, too much or not enough salt, too high or too light color, metallic, high acid, unclean, and old cream flavors, streaks and mottled color, mold on butter, and moldy and dirty packages.

The two styles of packages used for bulk butter were the "tub" and the "cube." In the Middle West, the creameries used the 63-pound ash tub, while New England States preferred butter packed in spruce tubs of 10, 20, 30, 50, and 60 pounds capacity. The use of the cube was confined almost wholly to the creameries located on the West Coast. The cubes were made of fir and spruce, with some holding 63 pounds, some 68, and others approximately 80 pounds of butter. In 1916, the net weight was standardized at 68 pounds.

In some of the larger eastern markets, much of the butter was retailed direct from the tub, and to some extent this was done with cubes on the Pacific Coast markets.

Various methods were used in order to determine the net weight of butter in tubs. It was customary among the trade in weighing butter to require "up weights": that is, the beam of the scale to balance against the upper rest, and when it did not, the next lower pound was taken; fractional weights usually were not counted.

The trend in the market distribution of creamery butter was toward individual consumer packages. The standard package most commonly used in the eastern markets was the one-pound print. The custom was still quite prevalent in some of the eastern markets to imprint on each roll, crock, or print of butter an ornamental design or emblem.

Throughout the New England States various styles of consumer packages were in use. The more common were known as the flat pound, flat half-pound, one-pound hotel bar, half-pound bar, and small tubs ranging from two to ten pounds. The usual consumer packages on the Pacific Coast were the one and two-pound flat prints. In the Middle West, the Elgin-style, one-pound rectangular print was popular.

The wholesale receivers of butter, eggs, and cheese in the larger markets had formed trade organizations. Auction sales were usually held each day and each member had the privilege of posting his offerings and bids. In order to facilitate trading between the members, rules and regulations were adopted. These provided for: (1) the establishment of classes and grades of butter; (2) an inspection service to apply the grades; and (3) the adjustment of disputes in trading between members.

In most markets the butter quotations were determined by market reporting agencies. Formerly, quotations were established through quotation committees.

The Producers' Price-Current issued the daily butter quotation for the New York market, which was used generally by the creameries of Minnesota, Iowa, and other States shipping to that market.

The Chicago Price-Current published the Chicago butter quotation which was used quite extensively by the creameries in Wisconsin, by some of the Iowa creameries, and by other creameries selling their butter on the Chicago market.

The butter quotation at San Francisco was published by the Daily Commercial News. The markets at Los Angeles, Portland, Seattle, Spokane, and Salt Lake City were influenced to some extent by the San Francisco quotation.

The general custom of country creameries in shipping butter to the larger markets was to consign it to the receiver or to contract with the receiver for the sale of the butter on the basis of the market quotation.

A considerable amount of butter was placed in cold storage during the season of surplus production, which began about April 1, and extended into August, when receipts of fresh butter on the markets were larger than the requirements for the consuming trade.

A STUDY OF WISCONSIN AND MINNESOTA CREAMERIES

The marketing practices of creameries in Wisconsin and Minnesota were studied by Potts from 1915 to 1917 (63). The study was conducted in cooperation with the University of Wisconsin, the University of Minnesota, and the Dairy and Food Department of the State of Minnesota.

Reports obtained in 1915 from 900 creameries in Wisconsin and Minnesota showed that only 27 received whole milk exclusively, 243 received both whole milk and cream, and 630 received separated cream only.

The infrequency of delivery of cream to creameries and other factors resulted in the marketing of considerable cream of inferior quality. A number of creameries, recognizing the relation of poor cream to poor quality butter, sought to encourage more frequent deliveries by establishing grades for cream and by paying different prices for the various grades. Usually two grades were employed and a premium of 2 or 3 cents per pound of butterfat was paid for the better grades of cream.

The shipment of butter to market was usually made by refrigerator freight. The schedule in most instances provided for weekly or semi-weekly shipments.

The consolidation of less-than-carload shipments into full carloads was effected at division points, where a number of cars were assembled on parallel tracks or along a platform. The butter destined to different markets was transferred into separate cars. Each shipment was thus forwarded by through fast freight to its final destination.

Northern Minnesota butter in less-than-carload lots, routed rail-lake-rail via Duluth to Buffalo and points beyond, took a combination of rates at Duluth and Buffalo. The tariffs of the lake carriers required a minimum of 15,000 pounds of dairy products. For the purpose of economizing in freight charges, the Minnesota shippers employed an agent at Duluth who effected consolidation of the shipments at that point.

The general practice of Wisconsin and Minnesota creameries in marketing tub butter was to ship it to wholesale receivers upon an informal agreement between the creamery and the receiver; under this plan the price to be received

usually was based upon a designated market quotation for "extras." The agreement frequently varied, including market quotation net f.o.b. shipping station; market quotation net f.o.b. receivers station; market quotation plus a premium less freight; market quotation plus a premium less freight and cartage; or market quotation plus a premium less freight, cartage, and commission.

As a means of identifying the shipments from each consignor, the receiver usually furnished the creamery with a rubber stamp or stencil which was used on the top of each tub. This stamp gave the name and address of the consignee, and the serial number of the creamery.

PRICES AND QUALITY OF CREAMERY BUTTER

In order to determine to what extent improvement in the quality of butter helped the creamery to obtain higher prices, G.P. Warber, assistant in marketing dairy products, Office of Markets, conducted a thorough study of the problem. His investigation covered the sources of supply of various cities in the United States, the prevailing grade or quality of butter sold in different markets, and the prices paid for different grades. The investigation began in the spring of 1914. During that time, over 1,000 creameries in all sections of the United States were visited by representatives of the Department. The grade of butter produced was determined and additional information was obtained about market outlets, the methods of marketing, and the prices obtained for various lots of different grades of butter shipped to merchants within the same and different markets (112). M.P.A. Sondergaard, dairy products manufacturing specialist, Bureau of Animal Industry, (BAI), who was an expert judge in the commercial grading of creamery butter, inspected and scored the various lots of butter.

Pricing of creamery butter was originally based on quotations from Elgin, Ill., in the beginning of the creamery butter industry of this country, the town of Elgin, was the center of the butter-producing region of the Middle West and it was the place where representatives of butter merchants in eastern markets made offers for the product of the creameries in that section of the country. The prices at which goods were sold on the Elgin Board of Trade were published, and the quotations thus issued came to be regarded as the basic wholesale price of the American butter market. As transportation and refrigeration facilities improved, the creameries in the Elgin territory were able to compete for the markets of every important city in the country, and the creameries in every part of the country sold butter at prices in line with the Elgin quotations.

The custom of basing the buying and selling prices of creamery butter on the Elgin quotations prevailed in many sections of the country, though the demands for market milk in Chicago and other neighboring centers of urban population had reduced the butter production in the "Elgin District" so that comparatively small quantities of butter were sold on the Elgin Butter Board. By action of the United States Food Administration, the Elgin Board of Trade on Oct. 31, 1917, suspended the issuance of butter quotations.

Chicago became the leading market center for creamery butter produced in the Middle Western States, because it was a large consuming center and possessed exceptionally good shipping and storage facilities.

Although there was a difference of opinion about the comparative quality standards of different markets, the experience of most creameries demonstrated the fact that the quality demands of the trade were different in different cities. Thus, the majority of the country creameries of Minnesota found that their shipments to Philadelphia and New York generally brought the highest net market returns. On the other hand, a large number of Iowa and Wisconsin creameries found that their net price returns were usually the highest in the Chicago market.

While there was a general tendency in all markets for prices to vary in accordance with the quality of the butter sold, there were occasional exceptions, especially in the case of buyers who based their judgment of quality upon known stencil numbers or trade-marks.

Warber concluded that an important function of an efficient butter marketing system was to effect such a distribution of the various grades of butter produced in various parts of the country that the product of each factory would be sold in the city where it would bring the highest return to the producer. Under the prevailing system of marketing country creamery butter, market returns to creamerymen were based upon market quotations issued by market reporting agencies and upon a method of grading which was controlled by the wholesale butter merchants themselves. Warber contended that a system of butter inspection and grading operated under the supervision of the Federal Government, available to shippers of creamery butter and wholesale and retail distributors, would tend to facilitate the market distribution of creamery butter on an equitable quality basis.

DAIRY MARKETING CONDITIONS IN NEW HAMPSHIRE

A dairy survey was made by L.M. Davis, assistant in marketing dairy products, in 1917, under an informal cooperative agreement between the Bureau of Markets, USDA, and the Extension Service of New Hampshire College. The main purpose of the study was to investigate and report on the important and fundamental and economic conditions affecting the production and marketing of New Hampshire's dairy products (43).

Consideration was given first to the extent of dairy development and the natural conditions which promote it. Then the trend of agriculture in New Hampshire and the type of dairy farming practice were considered. The facilities, methods, and costs of transporting milk to the larger city markets were treated in connection with milk marketing contracts and prices. The dairy and creamery butter industry in the State was reviewed in connection with the possibilities of developing local markets.

The opportunities, as well as some of the advantages, of cooperative organization of milk producers were pointed out, as they related particularly to the existing dairy conditions.

The major part of the milk produced in New Hampshire was shipped to Boston and other markets out of State, although there were many local markets for milk and dairy products.

Dairy butter (farm-made) was ordinarily put in the typical New England package, a one-pound flat print on which was imprinted an ornamental design or emblem. A five-pound rectangular and a round wooden package were commonly used for customers who desired to purchase more than one-pound lots.

Firms and individuals buying milk in New Hampshire followed different methods in dealing with patrons. Most of the milk was sold under contract, both verbal and written; usually the contracts were effective for six months beginning April 1 and October 1. Prices and other contract terms differed considerably among buyers. Likewise, practices with regard to payment of premiums for butterfat and sanitary quality were not uniform.

The standard milk can used in New Hampshire for shipping milk to market was the eight and one-half quart can. However, there was a tendency to change to larger cans, particularly the forty-quart cans, which were quite popular in most other parts of the United States. This change over to the larger cans was occasioned largely by a decision of the Interstate Commerce Commission, effective Oct. 1, 1916, whereby the leased-car system was abolished and a 20-mile zone system of rates established. The new schedule of rates based on the 20-mile zone system was beneficial to the producer. Previous to Oct. 1, 1916, most of the milk shipped to New Hampshire had been handled in cars leased by the railroads to dealers at a scheduled rate per trip or per annum. Under this system a dealer was granted exclusive right to the use of a car on the specified route. Ice and a caretaker were provided by the dealer, the railroad company providing free transportation for the caretaker.

Abolition of the leased-car system favored the efforts of producers to organize for collective action in marketing. The New England Milk Producers' Association (NEMPA), organized only a few years before, had made considerable progress but still controlled only about 10 percent of the milk shipped from New Hampshire. There was some uncertainty as to whether NEMPA or basic economic conditions of supply and demand had been the greater influence in raising the prices farmers received for milk, beginning in the fall of 1916.

¹ 30 Stat. 476

² 37 Stat. 295

³ 37 Stat. 854

⁴ U.S. Department of Agriculture, Department Conference on the Marketing and Distribution of Farm Products, Mar. 27, 1913, typewritten manuscript, 65 pp. (in USDA Library).

⁵ Ensrud, Adolph George, History of the Origin and Functions of the Federal Bureau of Markets. September 1922, 175 pp. (Univ. of Chicago).

⁶ Personnel folder of John A. Vye, USDA, Federal Records Center, St. Louis, Mo.

⁷ Personnel folder of Roy C. Potts, USDA, Federal Records Center, St. Louis, Mo.

HISTORY AND DEVELOPMENT OF GRADE STANDARDS FOR DAIRY PRODUCTS

Standards of one form or another go back many centuries in civilization. The Egyptians established "standards" of length, and the Romans required a set of standards of weights and measures which was to be used throughout the world.

During the early days of American agriculture, when most farms were self-sufficient units and marketing was largely a local function, there was no great need for standards. Farm surpluses were bartered for articles needed or were sold to nearby merchants, and questions of quality and price were argued between them. As settlements increased in the great grain-producing areas of the Middle West and as vast quantities of grain began moving long distances to centers of consumption and to foreign ports, marketing problems arose that had not existed in the earlier days. These problems were common to butter and cheese and other farm products.

Standards for identifying and describing farm products according to quality developed with the commercialization of American agriculture. Standards have to be developed before a product can be graded in any meaningful, understandable, and consistent manner.

The Constitution of the United States recognizes the necessity for standards and gives to Congress the power to establish such for coins, weights and measures. If content is standardized, it seems even more important to standardize quality, upon which value so much depends.

Three basic principles are followed in developing grade standards. First of all, there should be a need for the standards. Secondly, because use of the standards is voluntary, there should be interest and support from the industry. Thirdly, the standards should be practical to use.

Grade standards for dairy products, as for other agricultural commodities are not eternal and are not set in concrete. The architects of grade standards should recognize the necessity to modify or amend them, from time to time, consistent with modern technology and the demands of the marketplace. It is essential that grade standards be couched in clear and precise language with the greatest possible degree of specificity. To avoid confusion of interpretation, it is also essential to preserve and not abuse the accepted meaning of words. Whenever a distinction is made, for example, in describing the intensity levels of specific characteristics, such distinctions should reflect a commensurate difference in quality.

The criteria used in assigning grades to dairy products differ according to the characteristics of the various products. Because some products are naturally more variable than others, it is necessary to have more grades for some products than for others. Grade standards for each commodity have their own criteria and set of dynamics. Although there is no overlapping of quality between grades, a certain range or latitude in quality is allowed in each grade.

As one goes down the grade scale, the latitude in quality within each grade widens progressively (71, p. 555). For example, if one were to divide a pyramid outline into four equal segments, the peak representing Grade AA, the next segment Grade A, then Grade B, and the fourth segment at the base Grade C, the matter of quality tolerance between grades would become quite apparent.

Grade standards, to be realistic and effective, do not change according to market conditions, or from season to season, or geographic area. The same considerations apply to the interpretation and application of the standards through grading activity.

Grade standards go one step beyond the simple establishment of a minimum standard of identity. In other words, the construction of grade standards involves classifying all samples of a product into distinct levels or gradations of a product's characteristics or qualities which are at and above the minimum required for identification of that product as fit for human food. The standards of identity as promulgated under the Federal Food, Drug and Cosmetic Act of 1938, as amended, are not generally concerned with quality or sanitary requirements. These considerations are, however, involved in other provisions of the Food and Drug law.

Grade standards, to be of maximum value, should encompass the full range of marketable quality and should be based on factors that can be uniformly applied. Grade standards for dairy products should reflect the quality of the raw material and/or hygiene of manufacture. Fundamentally, quality, product stability, and safety of product depend to a large degree upon a sound raw material procurement program and good manufacturing practices. The quality of the finished product can be no better than the raw material from which it is made. However, the impact of good raw material can easily be nullified through undue holding time, inadequate processing facilities, improper processing methods, lack of sanitation, improper packaging and handling. Quality improvement and product stability are not self-perpetuating. They can vanish much faster than the time it took to obtain them.

It is not enough that a product be merely safe to eat. The best proof of that is the Agricultural Marketing Act, passed by Congress in 1946. Congress in enacting such legislation showed expressed interest in the improvement in the marketability of agricultural products through differentiation of products on the basis of quality. Such differentiations and universal acceptance of the grades have been a great boon to orderly marketing.

Standardization is essentially an aid to orderly marketing and efficient buying and selling. Unless market quotations can be associated with definite qualities of a product, they are of limited value as a basis of trading.

The theory of universal grade standards carries with it the necessity for a standard method of inspection and grading. Consequently any program of standardization, to be effective in commercial practice, should be accompanied by competent and unbiased inspection. The farmer expects and wants to receive

a fair price commensurate to the quality of the raw product delivered to the processing plant. The processor and distributor need a quality gauge to facilitate buying and selling, particularly at long distances. The consumer wants assurance that the quality of the product purchased is in keeping with the price paid.

Requests for standards may come from trade or consumer groups, State Departments of Agriculture, or others. USDA standardization specialists, who develop the standards, may initiate standards to more accurately reflect the type of product being produced. New standards are developed as new products come on the market or increase in consumer use.

The first step in developing standards is study of the product to determine the quality factors involved and the range of quality produced. Standardization specialists investigate cultural or production practices in major producing areas; varieties or types, production, packing, and processing techniques; and consumer buying practices. They may call upon statisticians for aid in drawing up plans to take samples of the product, developing criteria for evaluating quality, and a mathematical means of evaluating the information collected.

They interview producers, packers, processors, shippers, receivers, consumers, scientists and marketing specialists at experiment stations and universities, and others. Economic studies may be made to determine the attributes that are important to sellers and buyers, including the final consumers. Where possible, laboratory studies are made to find ways of measuring the physical differences in quality. Extensive data are collected on all quality factors and on defects that occur in the product.

Standardization specialists then draw up proposed grade standards which are published in the Federal Register under proposed rule making, and a specified time period is set to allow interested persons to study and comment on the proposal. A press release is issued at the same time to notify industry members, consumer groups, trade organizations, State Departments of Agriculture, and anyone concerned. Copies of the proposed standards are sent to those who request them. All comments are taken into account in considering whether the standards should be issued as proposed, with amendments, or withdrawn. If it is decided to promulgate the standards, they are issued in final form in the Federal Register, with a specified date on which they are effective. A press release is again issued. A revision of grade standards follows the same process.

On occasion the thought has been expressed that the USDA's standards for grades (including dairy products) should provide for zero tolerances for antibiotics and pesticide residues. All of the USDA grade standards for dairy products provide, "that compliance with these standards does not excuse failure to comply with the provisions of the Federal Food, Drug and Cosmetic Act." It would appear that such a provision is all that is necessary in the public interest.¹

GRADE STANDARDS FOR BUTTER

With the advent of creamery butter, general terms such as "fine," "good," and "fair" came into use to describe the quality of butter. Early in the last

quarter of the 19th century the industry used the terms "firsts," "seconds," and "thirds," to classify creamery butter quality. Creamery butter shipped from the West to eastern markets was recognized as being better in quality than farm butter, and became known as "western extras." About 1905 the word "western" was supplanted by "creamery" and the term became known as "creamery extras." Still later in the early thirties the word "creamery" was omitted and the grade was known as "extras."

In the last quarter of the 19th century, a number of judges employed a scorecard in evaluating the quality of butter samples exhibited at dairy conventions and agricultural fairs. These judges recognized distinct qualities in butter which were generally characterized as flavor, body, color, and salt. They also evaluated the butter for style or package. Different values were given to the different characteristics or attributes, according to their relative importance. There were variations as to the numerical values assigned to the component parts. However, at the turn of the century a uniform scorecard was in use, on the basis of the following points: flavor 45; body 25; color 15; salt 10; and package 5, for a total of 100.

The rules and regulations of the New York Mercantile Exchange actually provided for a seasonal sliding scale of quality standards. For example, "extras" might score 91, 92, or 93, according to variations in the quality of current receipts at different seasons of the year. The exact standard which prevailed from time to time was determined by a committee of the Exchange (70, p. 7).

In other cities, trade organizations nominally maintained more constant standards, but in actual practice, the application of the standards varied somewhat according to changes in the quality of current market receipts.

Just prior to and during World War I, the National Poultry, Butter and Egg Association established grade standards for creamery butter and defined, for example, "extras" as consisting of the highest grade of butter, during the season when made, scoring 93 points or higher (70, p. 7). Some members of the Association were extremely desirous of having the wholesale trade organizations of Chicago, New York, Philadelphia, and Boston adopt uniform grade standards for butter. They were of the opinion that if these trade organizations could agree upon specific standards, such action would go a long way toward establishing uniformity over the entire country. A committee was organized to study the matter, but after several years of discussion it was unable to obtain acceptance of a uniform set of standards.

Desire for greater efficiency in marketing caused some of the leaders in the butter industry to become aware of the need for developing a more uniform system of national quality standards that would provide the basis for improving quality, standardizing of product, and facilitating trading over the country as a whole.

The Bureau of Markets was studying this problem at the time of World War I. Under date of May 20, 1918, Roy C. Potts pursuant to a request by Charles J. Brand, Chief, Bureau of Markets, submitted an outline for the proposed inspection service of dairy products.² The War Department had already expressed a desire to use the service as soon as it was established.

On June 17, 1918, Potts addressed another memorandum to Brand, submitting a tentative outline of grade standards for creamery butter proposed for use in the market inspection of creamery butter.³ Copies of the outline were also furnished to various technicians within the Department for comments and suggestions. The market grades of creamery butter were to be established on a score basis, with weights given to the various quality factors, i.e., flavor 50; body and texture 20; color 10; salt 10; brine 5; and package 5, for a total of 100. Standards or requirements of each quality factor were described, as well as conditions and methods of inspection or grading.

On the basis of suggestions received from industry, Potts, with the assistance of Charles W. Fryhofer, formulated a set of grade standards for butter which were recirculated within the Department. The revised proposal modified the weight given to the quality factors as follows: flavor 45; body 25; color 15; salt 10; and package 5.

In the spring of 1919, Harry W. Redfield, In Charge, Inspection Microbiology, Bureau of Chemistry, USDA, strongly recommended that consideration be given to wholesomeness as well as palatability. Also, he recommended that butter made from pasteurized cream should grade higher than butter made from unpasteurized cream (which had equally good flavor when fresh and other factors equal), both because of its greater wholesomeness and its better keeping qualities.⁴ Redfield did not agree with the scale of maximum ratings given to the various quality factors. He recommended that 90 points be assigned to flavor and the remaining 10 points be assigned as follows: body 4; color 3; salt 2; and package 1.

As an alternative to this, Redfield recommended that two new factors be introduced, namely, freedom from decomposition products and pasteurization of cream, with the points allotted as follows:

The recommendations of Redfield were not incorporated in the final draft of the grade standards for butter. His concept of flavor dominance was vindicated in the direct-method approach to grade standards adopted by the Department twenty years later, however, which recognized the overwhelming importance of flavor in evaluating the quality of the end product.

At the time the Federal grade standards for butter were being formulated, several methods were being employed for inspecting and judging butter to determine its score or grade. One method in common use was the scorecard described on p. 14, generally used in educational work, to give students instruction and training in the judging of butter and the rating of defects in the various factors.

Each factor was rated independently of the ratings of the other factors. Butter seldom received a flavor rating of more than 40 of the possible 45 points. Other quality factors showing no defects received their maximum

ratings, while the ratings for factors showing defects were reduced according to the extent of these defects. The resulting total of ratings thus assigned to the five quality factors was the final score of the sample.

The main advantage of the scorecard method was its simplicity and ease of application in educational work. Judges employing the scorecard method in educational and contest scoring in the 1890's and early part of this century were handicapped, however, since there was no detailed or uniform scoring guide available to assist in achieving uniform grading results.

A second method of judging butter, employed in a few wholesale markets, involved quality standards established by general definition. The grades were loosely defined, and the interpretation and application of grades by a market inspector were frequently not well understood by anyone except the dealers in that particular market. Also, this method did not offer the educational advantage of the scorecard method.

A third method, which was the one commonly used in the more important wholesale butter markets, was a combination of the two preceding methods, but the scorecard employed in commercial grading was not used in exactly the same way as it was in educational grading. In commercial grading, the quality requirements of each grade and the permitted defects in each factor for each grade were established by definition, and the scorecard was used more as a method of reporting than of arriving at the results.

The first Department grade standards for butter were set forth in the Bureau of Markets, Service and Regulatory Announcements No. 51, effective May 28, 1919, under authority of Public Law 219, 65th Congress, approved Oct. 1, 1918.⁵ The grade standards were applicable to creamery, dairy (farm made), and process or renovated butter.

The standards provided for scores ranging from 75 to 95, inclusive. Each score constituted a grade. The factor of flavor was rated independently of all other quality factors, with 45 points for perfection. The ratings for body, color, salt, and package were established according to the maximum ratings permitted under the definition of the respective scores, in relation to the rating given for flavor. For example, a sample of butter which was given a rating of 38 points for flavor, and showed a perfect rating for body, color, salt and package, would receive a total score of 93 points. However, specific workmanship defects were given different ratings or "cuts," depending upon the flavor ratings assigned to the given churning of butter. Thus, if a sample of butter was assigned 38 points for flavor and the maximum for body, salt and package, but possessed a definite mottled color, a cut of 6 points would be made in the rating for color, to reduce the U.S. score to 87, as required by definition. If, however, the butter received a flavor rating of 35 points instead of 38, and possessed a definite mottled color, the rating for color would be cut only 3 points, resulting in a final U.S. grade of 87, the maximum score allowed under the definition. Similar adjustments were made for other combinations of flavor and workmanship defect characteristics, according to the definitions for scores.

The sum of the numerical ratings or evaluations of all essential factors of a theoretically perfect product was 100. Thus, the scorecard became a numerical standard by which the quality was measured. Flavor was the only factor on the scorecard that was never given a full score; it was assumed that no butter could be perfect.

After more than a decade of experience with the original butter grades, the Department in the early thirties began to experiment with a more direct method of grading butter. In late fall 1931, Roy C. Potts and Charles E. Eckles, national supervisor of dairy products grading, developed a skeleton outline of a set of quality standards encompassing a fresh approach to the formulation of grade standards for butter. The new approach abandoned the scorecard concept and instituted a direct method for grading butter. The direct method approach consisted of a system of grading whereby the flavor of the butter was given a rating in terms of the final score of the butter, provided all other quality factors were perfect. If, however, the butter had defects in body, color, salt and/or package in excess of the permitted amount, the final grade was lowered accordingly. This principle was based upon the fact that the quality of workmanship was of less importance as the flavor rating decreased. The outline of the new concept was submitted to the field offices of the inspection and grading service (see pp. 154-155) for establishment of grading service) for trial application, in January 1932. The author, who was stationed at the Philadelphia office at that time, found the new approach to be workable and practicable after two months' experimentation.

Potts and Eckles jointly prepared a paper titled "A More Simplified and Direct Method of Grading Creamery Butter," which was presented at the meeting of the American Dairy Science Association (ADSA), at Lexington, Ky., June 28-30, 1932 (64). The response to the new approach was not enthusiastic, but ADSA did appoint a committee to study the proposal and later in the year expressed a negative reaction.

In December 1934, the Agricultural Adjustment Administration (AAA) proposed a marketing agreement for the creamery industry, under the Agricultural Adjustment Act, covering the eleven far-western States, including a program of cream grading and grade labeling of butter. The program was developed by the dairy section of the AAA in cooperation with other groups, for the Pacific Coast and adjacent territory (7, p. 9). It was felt that consumers would pay premium prices for a high-quality butter in packages labeled to designate the grade in an easily understood and accurate manner.

Public hearings were held in March and April 1935 in Missoula, Mont.; Seattle; Portland, Ore.; San Francisco; Los Angeles; Salt Lake City, and Denver (17, p. 25). The proposal set up five grades of cream based upon five grades of butter, running from 93 score to 88 score, with the butter packages to be branded or lettered AA, A, B, C, or D. The proposal was not received favorably and the marketing agreement never became operative.

No further study was given to the 1932 suggested simplified grade standards by USDA until the spring of 1935, when Edward Small was appointed as national supervisor for the inspection and grading of dairy products. In May of that year, Roy Potts arranged for Charles Fryhofer and Small to work with him in the

formulation of a comprehensive set of grade standards based on the direct-method concept. This assignment was completed within two weeks. For the next 2 years, Small periodically experimented and worked with the new concept among USDA butter grading personnel, industry butter graders, the scientific community, and some State Department of Agriculture experts. He also gave grading demonstrations of the direct method before various groups during these two years.

On May 15, 1937, USDA announced that conferences would be held throughout the country in June and July, to consider the new U.S. grades for butter. The conferences were held at Los Angeles, San Francisco, Seattle, Portland, Ore., Salt Lake City, Lincoln, Neb., Ames, Iowa, Chicago, and New York City (32, p. 6).

All of the conferences were chaired by C.W. Kitchen, Assistant Chief, Bureau of Agricultural Economics, in charge of all regulatory and service activities, including the formulation of grade standards and the inspection and grading of all agricultural commodities. Potts attended each conference and Small was charged with the responsibility of presenting the proposed new grade standards and answering all technical questions. The conference at Lincoln was held in conjunction with the annual meeting of the American Dairy Science Association, and the one at Ames in conjunction with the annual meeting of the American Institute of Cooperation. About one thousand persons attended the nine conferences, with the largest attendance at Lincoln (84, p. 2).

The proposed butter grades reflecting the direct method of grading embodied new features including:

(a) discontinuance of the scorecard-definition method of prorating the score to various factors and the substitution of a more simplified method of rating each factor. Flavor and defects in workmanship factors were rated independently according to the applicable established standards.

(b) a narrowing of the range of scores from the old basis of 75 to 95 to a new basis of 85 to 93, consisting of nine grades;

(c) discontinuance of the package as a factor in determining the quality of butter. In many instances butter was packed in used or reconditioned tubs by individual creameries and shipped to assembling warehouses where most of the butter received was cut and wrapped and packed in fiber containers for shipment or distribution to the consuming centers. If the bulk butter which was graded at the assembling warehouses was lowered in grade because of package defects the assembler would or could have reaped an unwarranted harvest.

A set of consumer grades was included, called Grades AA, A, B, and C, equivalent to 93, 92, 90-91, and 88-89 score, respectively. The industry reaction to the new proposal was decidedly mixed; lukewarm in some sectors, with strong opposition in many quarters to the consumer grades. It was obvious that individual opinions were influenced by competitive considerations, unquestionably due to the manner in which the grade plan had been developed for consumer projection. The Consumer Union, in principle, was in favor of the consumer grade section of the grade standards. The opposition to the consumer grades was not unexpected since many in the butter industry expressed considerable objection to the proposal in the formative stage and threatened to boycott or disrupt the conferences unless Kitchen chaired the sessions.

At that time over half of the total production of creamery butter was made from sour cream, most of which graded no higher than 90-91 score and some 88-89 score. Under a consumer grade labeling program such butter would have been marked Grade B or C. Moreover, many in the butter industry feared that the introduction of consumer grades on a voluntary basis would lead to a mandatory consumer grade labeling program.

Before all of the conferences were completed it became apparent that the consumer grade concept would have to be dropped and it was.

Despite the reactions to the proposed consumer grades presented at the nine 1937 conferences, the Federal officials were not discouraged; for they knew, from experience, that the basic grade standards embraced by the direct method were highly workable and livable.

Additional significance had been attached to the proposed revision of the grade standards because of the provision in the Commodity Exchange Act of 1936, which required that all contracts of sale for future delivery were to be based on U.S. Standards, if such standards were officially promulgated. Butter was one of the commodities covered by the Commodity Exchange Act.⁶

Lloyd S. Tenny, Business Manager, Chicago Mercantile Exchange, and N.W. Hepburn, Executive Secretary, American Butter Institute, at the suggestion of Kitchen, organized a committee in the late summer of 1937 to meet with Edward Small occasionally to review the proposed revision of the butter standards. On that committee were such outstanding men as: Merlin G. Bush, The Great Atlantic and Pacific Tea Company, Chicago; Harley Credicott, Freeport Produce and Creamery Company, Freeport, Ill.; Walter H. Grell, Armour and Company, Chicago; Frank Goodrich, Swift and Company, Chicago, O.F. Hunziker, Blue Valley Creamery Company, Chicago; George Mahle, Sugar Creek Creamery Company, Danville, Ill., Joseph T. Milnarik, Chicago Mercantile Exchange, Chicago; and Clarence A. Nielsen, Wapsie Valley Creamery Company, Independence, Iowa.⁷ The most significant change which resulted from the committee sessions was the clarification in the description of U.S. 93 score butter. In the proposed version it was stated that such butter was made from sweet cream. This was changed to read, "made from cream to which a culture (starter) may or may not have been added." This change erased the notion that fine starter butter could not qualify for U.S. 93 score.

The Tenny-Hepburn committee urged the Department to publish the grade standards in tentative rather than official form so that industry and others would have an opportunity to work with them for a year or so before the standards would become official. The revision was issued as "Revised Tentative United States Standards for Quality of Creamery Butter," and became effective April 1, 1938.⁸

The working smoothness of the transition from the scorecard method to the direct method of grading butter was most satisfactory and comforting. Once in operation there was absolutely no resistance to the new Federal grade standards and grading system; as a matter of fact, the industry much preferred it to the previous scorecard approach. In many instances, organizations and companies

prepared and posted grading charts in their butter grading rooms, in conformity with the new grade standards, for reference use by their own private graders. There soon developed universal commercial acceptance of the direct method of grading butter which holds to this day. The scorecard method of grading is, however, employed for educational purposes and is used in contest judging work.

As a result of the experience gained in applying the standards, certain minor changes were prepared by Edward Small and the Department published them as official standards in the Federal Register, Nov. 4, 1938, effective Apr. 1, 1939.

Prior to World War II almost all butter was made from farm-separated cream, either sweet or sour. Some creameries followed the practice of delivering farm-separated cream to the factory twice a week, and usually butter made from such cream graded 91 score. During the war there developed a heavy demand for products originating from whole milk, which required a general change in procurement from farm-separated cream to whole milk. Accordingly, the range in quality narrowed significantly and the manufacture of 91 score butter decreased appreciably. The war emergency required the employment of many new butter graders. All of this pointed to the need of updating and simplifying the 1939 grade standards.

The first revision of the official grade standards based on the direct method of grading, prepared by Bennett J. Ommodt, was published in the Federal Register, Feb. 2, 1943, effective Apr. 1, 1943.¹⁰ The main changes from 1939 standards were: (a) a reduction in the number of United States grades from 9 to 5 (AA or 93 score, A or 92 score, B or 90 score, C or 89 score, and Cooking Grade; (b) the flavor rating was expressed in terms of a letter designation only and the final U.S. grade was shown in terms of a letter grade designation as well as a numerical rating (dual nomenclature); (c) elimination of U.S. 91 score; and (d) condensed description of grade standards to a single sheet.

A revision of the grade standards was prepared by C.J. Babcock and D.R. Strobel and published in the Federal Register, Feb. 8, 1952, under proposed rule making.¹¹ This revision proposed the elimination of the dual nomenclature for grades and use of letter grade designations only, along with other major and minor changes. A significant portion of the butter industry opposed the elimination of the dual nomenclature and USDA announced in the Federal Register, Apr. 26, 1952, that it was postponing further action on the proposed revision, pending further study.¹²

A second revision, prepared by Babcock and Strobel, reinstating the dual nomenclature, was published in the Federal Register, Mar. 9, 1954, under proposed rule making¹³ and Mar. 30, effective Apr. 1, 1954.¹⁴ The principal changes from the 1943 standards related to: (a) a reduction in the number of official grades from 5 to 4, with the Cooking Grade discontinued; (b) a tightening of U.S. Grade B or U.S. 90 Score with respect to neutralizer flavor; (c) the addition of a cream pasteurization requirement; and (d) the addition of a section labeled, "Explanation of Terms," outlining briefly a description of the characteristics of butter.

The third revision, developed by Small and Floyd Fenton in the fall of 1959, was published in the Federal Register, Oct. 29, 1959, under proposed rule making,¹⁵ and in final form Jan. 28, 1960, effective Apr. 1, 1960.¹⁶ The basic changes or modifications involved: (a) a tightening of the allowable workmanship defects (body, color, and salt); (b) a tightening of the quality requirements for U.S. Grade C or U.S. 89 Score, by eliminating some of the flavor defects previously allowed; (c) a more detailed and definitive description of quality characteristics; (d) the inclusion for the first time of detailed descriptions of workmanship defects according to degree or intensity; (e) a provision for the first time specifying that butter with excessive workmanship defects would be given a flavor rating only; and (f) a provision for the first time spelling out the specific conditions under which butter would not be assigned a grade.

Also for the first time, a supplement, "Probable Causes of Certain Characteristics in Butter," was appended to the revised grade standards. This appended material furnished guidance to the buttermaker to help him avoid deficiencies in manufacturing and possible downgrading of his product. The supplement was formulated to encourage greater effort towards achieving improved workmanship and spreadability of butter and better product stability.

An amendment to the U.S. Standards for Grades of Butter providing a more objective means of determining the degree of "leakiness" was proposed by Floyd E. Fenton and Robert F. Anderson in November 1967. The proposed amendment was intended to clarify the meaning of the various degrees of leakiness. It provided for the use of a moisture indicating test paper, which recorded the number and relative size of water droplets on a freshly cut surface of butter. The test paper was then compared against a proposed "USDA Chart for Moisture Dispersion in Butter" -- a photographic standard depicting three degrees of leakiness, i.e., "slight," "definite," and "pronounced." The standardized chart was prepared after many determinations and comparisons of degrees of leakiness were made under actual grading conditions. The proposed amendment was not approved for publication in the Federal Register and further efforts to reintroduce the test in the grade standards were not pursued.

The U.S. Standards for Grades of Butter were updated by Joseph Rubis, Richard Webber, and Roland Golden in the fall of 1976 and published in the Federal Register, Nov. 11, under proposed rule making,¹⁷ and in final form Feb. 1, 1977, effective Apr. 1, 1977.¹⁸

The major changes in the updating of the grade standards pertained to (1) abandoning dual nomenclature used in designating grades, since numerical scores were no longer of value to the industry and the consumer, and (2) deleting Grade C since very little butter of this quality exists, as a result of steady quality improvement.

GRADE STANDARDS FOR CHEDDAR CHEESE

In the early history of the American cheese industry, before modern transportation and cold-storage facilities were available, the season's

production was kept in curing rooms at the factories and was not marketed until after it had been well cured. The cheese was held for ripening at temperatures ranging from 60° to 70°F.

The prevalent opinion among cheese dealers had always been that low temperatures, varying from 35°F. to 50°F., or thereabouts, resulted in the production of an inferior quality of cheese, in comparison with that from 60° to 70°F. No carefully controlled experiments bearing on this problem had been recorded earlier than those undertaken by S.M. Babcock and H.L. Russell of the Wisconsin Agricultural Experiment Station and described in the Fourteenth (1897) Annual Report of that station. The first public presentation of those experiments was made at the meeting of the Wisconsin Cheesemakers' Association, in Feb. 1901 (37, p. 7). The results showed that cheese placed at refrigerator temperature (45 to 50°F.), directly from the press, was of superior flavor and texture, and that such cheese was wholly free from any bitter or other undesirable flavors.

In order that a much larger experiment might be instituted, covering the different types of cheese as represented by Eastern as well as Western manufacture, Stephen Moulton Babcock and Harry Luman Russell of the Wisconsin Agricultural Experiment Station presented this matter for consideration to the Dairy Division of the Bureau of Animal Industry, USDA. As a result, the officers of the New York Agricultural Experiment Station were also consulted and plans perfected for cooperative experiments conducted simultaneously in Wisconsin and New York, in 1902 and 1903 (37, p. 8).

The cheese for these experiments was held for curing at temperatures of 40°, 50°, and 60°F., and examined periodically for quality. The cheese held at 40° and 50°F. was generally of a better quality than that held at 60°F. The cheese industry soon switched from "warm-curing" to "cold-curing" of American Cheddar cheese.

The methods of manufacturing American Cheddar cheese were unstandardized and the quality requirements of the different markets varied considerably, resulting in a lack of uniformity in the judging of quality. For the most part, cheese had been sold as cheese, and little reward given for quality. In the absence of national grade standards, commercial inspections were based chiefly upon the personal preference or opinion of the judge or inspector, and the special requirements or preferences of the market for which or in which the inspection was made. The finer distinctions in quality generally were given minor consideration, and ordinarily, cheese having a firm body, either a close, medium close, or medium open texture, a mild or sharp clean flavor, the desired color, and good finish, was considered of "good" to "fancy" quality.

It was apparent, in 1922, to the department of agriculture that there was a need for national grade standards and a grading system for American Cheddar cheese. Accordingly, Charles W. Fryhofer and Roy C. Potts developed appropriate grade standards, which were published in early 1923.¹⁹ Quality evaluation was based on definition and the scorecard method, with maximum ratings given to the factors as follows: flavor, 30; body and texture, 40; finish and appearance, 20; and color, 10 points.

The grade standards provided for a classification of the cheese based upon age or degree of flavor, i.e., "fresh," "mild," or "aged." They also provided for a classification based upon texture, i.e., "close," "medium close," or "open," and a classification based upon color, i.e., "uncolored," "medium colored," or "high colored."

The quality of cheese was designated by score or grade and the standard for each 3-point range of score was defined by certain characteristics considered essential to cheese within each range of score. Six grades were established: U.S. Extra Fancy, 95 Score and above; U.S. Fancy, 92 to 94 Score; U.S. No. 1, 89 to 91 Score; U.S. No. 2, 86 to 88 Score; U.S. No. 3, 83 to 86 Score; and Culls, below 83 Score. The format for the determination of the final score possessed some weaknesses similar to those inherent in the "definition scorecard method" for rating butter.

During World War II, the scorecard method of prorating the score to the various quality factors was abandoned, and Harry L. Wilson developed a more direct method of classifying each quality characteristic. These grades were more detailed than the grade standards of 1923. The revised grade standards embodying the direct method of grading were issued in May 1943, as "Tentative U.S. Standards for Grades of American Cheddar Cheese," and published in mimeograph form only.²⁰ The standards provided for four basic grades: U.S. Grade AA or U.S. Fancy; U.S. Grade A or U.S. No. 1; U.S. Grade B or U.S. No. 2; and U.S. Grade C or U.S. Undergrade. Cheddar cheese that failed to meet the requirements of U.S. Grade C or U.S. Undergrade was classified as No Grade. The quality of the cheese was judged on the basis of flavor, body and texture, color, finish and appearance, and according to the degree of ripening, i.e., "fresh or current make," "medium cured," and "cured or aged."

In announcing the tentative grade standards, the Food Distribution Administration invited recommendations from industry, the scientific community, and other interested persons. Two committees of the American Dairy Science Association interested in grading cheese met at Columbia, Mo., in June 1943 to discuss the tentative U.S. Grades for Cheddar cheese. Representatives of the Food Distribution Administration were invited to take part in the discussion. The National Cheese Institute was represented by men appointed from its members by its Acting Secretary, Wilbur Carlson.

The ADSA committees on cheese and judging dairy products in joint session instructed their chairmen to summarize the recommendations and criticisms of the committees in respect to the tentative grade standards and to present the summary to the Food Distribution Administration. The two committees were directly concerned in these specifications because of their impact on teaching procedures and on the evaluation of cheese quality in experimental as well as commercial practice. The recommendations and criticisms were transmitted in a special report to T.G. Stitts, Chief, Dairy and Poultry Branch, Food Distribution Administration.²¹

According to the Special Report, the committee members and industry representatives felt the tentative grade standards were too complicated to be applied accurately in commercial grading practice. Also, objections were raised to the alphabetical grade designations since they were essentially

"consumer" grade identifications. The report further stated that past experiences indicated that commercial grading specifications must be direct, brief, easy to read, and to apply. To illustrate their contention, the report pointed out that at cheese grading clinics held in Wisconsin in September 1942, participated in by State-licensed commercial graders and Wisconsin supervising graders, grading on the basis of three Wisconsin grades, three out of ten graders failed to grade the cheese with the majority. It was also pointed out that Wisconsin grading definitions were very simple and completely stated in approximately 300 words. In addition, it was alleged that the length and complexity of the tentative U.S. grade standards would make it even more difficult for graders to agree, and would cause needless confusion and expense for industry as well as for those who supervised the accuracy of grading. The main objection to the letter designations was industry's concern as to the possibility of compulsory grading on cheese offered to the retail trade.

The tentative grade standards, with slight revisions, were proposed by Babcock and Strobel as official U.S. grade standards in 1950. They were published in the Federal Register, July 8, under proposed rule making,²² and in final form Dec. 2, 1950, effective Jan. 1, 1951.²³

In the spring of 1954, Babcock and Strobel proposed an amendment to the grade standards to permit rindless (cured-in-package) Cheddar cheese to be wrapped in a non-transparent wrapper such as aluminum foil. The amendment was published in the Federal Register, May 8, 1954,²⁴ as a proposal, and in final form June 23, 1954.²⁵

Based upon approximately 15 years of extensive experience in grading Cheddar cheese during World War II and the post-war period, a proposed comprehensive revision of the grade standards was formulated by Small and Fenton. The work on the revision started in November 1954, and was completed in December 1955.

These grade standards were more complete, specific, and informative than earlier standards. Four grades were established, namely, U.S. Grade AA, U.S. Grade A, U.S. Grade B, and U.S. Grade C. The grades were based on four quality factors: flavor, body and texture, finish and appearance, and color. Characteristics or defects, including intensity, of each quality factor, according to the degree of curing were classified. The final U.S. grade for any given vat of cheese was established on the basis of the lowest rating of any one of the quality characteristics present. Condensed, as well as detailed tables, were used to tabulate characteristics according to the degree of curing, thereby providing quick references for the specific grades.

The proposed revised standards were field tested by Small, Fenton, and Harold Meister on Dec. 12 and 13, 1955, at Green Bay and Plymouth, Wis., and discussed with Harvey J. Weavers, L.I. Legrid, and Emil A. Zorn, Dairy and Foods Division, Wisconsin Department of Agriculture, Madison, on Dec. 14.²⁶ They had been furnished with copies of the proposed revision in November and were favorably impressed with the new grading approach.

In January 1956, conferences to discuss the revision were held in Chicago, Springfield, Mo., Albany, N.Y., Salt Lake City, and Portland, Ore., by Small, Fenton, and Harold Meister. Each conference was well attended by industry representatives, the scientific community, and representatives of the State departments of agriculture. The proposed revision was published in the Federal Register, Jan. 28, 1956, under proposed rule making.²⁷

To help bring about a better understanding of the proposed revision of the grade standards, USDA scheduled a series of grading clinics in February 1956 in Monroe, Marshfield, and Green Bay, Wis., Louisville, Ky., and Springfield, Mo. The grading clinics were attended by industry, Federal, and State cheese graders.

The final revision of the grade standards was published in the Federal Register, Mar. 28, 1956, and became effective May 1, 1956.²⁸ Proper application and use of these grade standards has aided the industry in marketing and merchandising better quality Cheddar cheese. The consuming public has been the ultimate beneficiary. The Wisconsin State Department of Agriculture adopted the new grade standards for Cheddar cheese, basically as issued by the USDA.

In 1960, study was given to the development of a supplement to the grade standards to explain the causes of the various characteristics and deficiencies of Cheddar cheese. This material was appended to the grade standards Dec. 21, 1960.

GRADE STANDARDS FOR SWISS CHEESE

During World War II, the Office of Price Administration (OPA) was given the primary responsibility for establishing and enforcing price ceilings within certain legislative authority and limitations. OPA had urged the Dairy and Poultry Branch, Office of Distribution, USDA, to formulate grade standards for Swiss cheese so that applicable price ceilings could be applied at the consumer level. However, the Emergency Price Control Act of 1942 was amended to prohibit the Administrator of OPA from requiring consumer grade labeling of any commodity.²⁹

Other requests, at that time, were made to USDA to design grade standards for Swiss cheese, and Harry Wilson formulated a set of such standards in the summer of 1944. He presented the proposed tentative grade standards in Madison, July 13, 1944, to a group of 16 Swiss cheese experts: three from the Wisconsin State Department of Agriculture, two from the University of Wisconsin, nine representing various segments of the Swiss cheese industry, and two USDA representatives. In addition, copies of the proposed grade standards were transmitted to various universities and industry representatives for study and comments.

Tentative U.S. Standards for Grades of Swiss Cheese were issued, in mimeograph form only, and became effective Oct. 15, 1944.³⁰ Six grades were established, namely, U.S. Grade AA or U.S. Fancy; U.S. Grade A or U.S. No. 1; U.S. Grade B or U.S. No. 2; U.S. Grade C or U.S. No. 3; U.S. Grade D or U.S.

Grinders; and U.S. Grade E or U.S. Undergrade. The grade of Swiss cheese was determined on the basis of its characteristics with respect to flavor, body, eyes and texture, finish and appearance, salt, and color; for both current make and cured cheese.

The tentative grade standards for Swiss cheese were revised by C.J. Babcock and D.R. Strobel and proposed as official U.S. grade standards in the Federal Register, Dec. 8, 1951.³¹

The proposed official standards were based on flavor, body, eyes and texture, finish and appearance, salt, and color. The following grades were established: U.S. Grade A, U.S. Grade B, U.S. Grade C, and U.S. Grade D. The number of grades was reduced from six to four, with U.S. Grade AA being eliminated. A second change concerned a reduction in the required eye size of Swiss cheese that qualified for the top grade. The new standards specified that to meet the requirements of the top grade, U.S. Grade A, the majority of the eyes had to be at least one-half inch in diameter.

Considerable interest developed in the grade standards and industry and others urged the Department to schedule a meeting whereby interested parties would be given an opportunity to further express their views regarding the standards. Accordingly, Babcock and Strobel presented the proposed revision of the grade standards before a group of Swiss cheese experts at Madison, Wis., Mar. 12, 1952; the author participated in the discussions at this meeting.

As a result of the widespread interest in the proposed standards and the many comments and suggestions received, the proposed standards were revised and published again under proposed rule making on Nov. 13, 1952.³² They were published in final form in the Federal Register, Jan. 6, 1953, effective Feb. 5, 1953.³³

The grade standards, as amended by Floyd Fenton, were published in the Federal Register, May 5, 1966, under proposed rule making,³⁴ and in final form, July 12, effective Aug. 11, 1966.³⁵ Allowance was made for a minor amount of mold under the wrapper or protective covering for current make as well as for the cured classification.

GRADE STANDARDS FOR BULK AMERICAN CHEESE FOR MANUFACTURING

About 1956, the American cheese industry began to package cheese in large bulk steel barrels holding about 500 pounds. This form of cheese had become important for use in pasteurized process cheese products. Some experiments have been conducted in more recent years in packing such cheese in octagonal corrugated fiber containers.

In August 1960, the Department responded to industry requests by agreeing to tentatively grade Cheddar cheese packed in steel barrels. The U.S. grade standards for Cheddar cheese were used during the trial period. Manufacturing and packaging deficiencies were appropriately noted. During the next several years, advances in technology were achieved by industry, accompanied by a substantial increase in the use of bulk cheese for manufacturing. With these

developments, the Research Committee of the National Cheese Institute asked the Department in December 1968 to develop a separate U.S. grade standard for bulk cheese for manufacturing. The Department agreed to draft a proposed standard which would recognize the differences in quality characteristics and end use between Cheddar cheese and bulk cheese for manufacturing applicable to cheese packed in barrels and other bulk form.

Field studies were conducted by Floyd Fenton, Eugene T. McGarrahah, and Richard W. Webber, and proposed standards were published in the Federal Register, Oct. 27, 1971,³⁶ for industry review and comments. The proposed grade standards were given extensive field trials to prove their effectiveness and to make industry familiar with the provisions of the standards. The final version of the grade standards was published in the Federal Register, Dec. 22, 1971, effective as of that date.³⁷ It was found that good cause existed for not postponing the effective date until 30 days after its publication in the Federal Register in that (1) immediate assistance would be provided for the commercial trading of bulk American cheese for manufacturing on the basis of U.S. grade, (2) the Government purchase programs would be assisted by having a specific U.S. grade standard for this product, and (3) compliance with the standard would not require any special preparation on the part of industry which could not be completed by the effective date.

The grade standards contain three quality levels: U.S. Extra Grade, U.S. Standard Grade, and U.S. Commercial Grade. The U.S. grades of barrel cheese or other bulk forms for manufacturing are determined on the basis of rating the following quality factors: flavor, body and texture. The flavor criteria for barrel cheese is essentially the same as that presently used in the Cheddar cheese grade standards. The standards are applicable only to cheese made for use in the manufacture of pasteurized process cheese products or as an ingredient in other food products.

GRADE STANDARDS FOR MONTEREY AND COLBY CHEESE

For several years the Department had received requests for official grading service on Monterey and Colby cheeses. The interest stemmed from cheese manufacturers and State departments of agriculture. The Department studied the advisability of developing grade standards for both varieties of cheese and concluded that such standards would be beneficial to the orderly marketing of the cheeses in the United States and would also be beneficial to consumers.

During the development period, Floyd Fenton and Richard Webber conferred with the industry, the academic community, and various State departments of agriculture to obtain technical advice. This information, together with the technical data, knowledge, and experience within the Department, formed the basis for establishing grade standards for each of the two varieties of cheese. The grade standards were field tested to determine that Monterey and Colby cheeses could be adequately and properly graded. The grade standards for Monterey and Colby cheeses were published in the Federal Register, Sept. 13, 1972, under proposed rule making,³⁸ and in final form Dec. 7, 1972, effective Jan. 15, 1973.³⁹ The grade standards were based on flavor, body and texture, color, and finish and appearance. The final U.S. grade is established on the basis of the lowest rating of any one of the quality factors.

GRADE STANDARDS FOR NONFAT DRY MILK

The first grade standards for dried skim and dried whole milk were formulated by the American Dry Milk Institute (ADMI), in 1929, primarily for industry use. They were, however, used by the Federal Government in its purchase program for relief distribution in the mid and late 1930's and early 1940's for wartime needs. These standards contained all of the elements then considered necessary for evaluating the quality of the product. Three of the quality factors were determined by organoleptic examination; viz., flavor, color and texture. Six other quality factors--moisture content, solubility, acidity, butterfat, bacteria count, (standard plate count) and sediment--were evaluated on the basis of laboratory testing. Two grades were established for dried skim milk, Extra and Standard, for each process of manufacture; i.e., spray, vacuum drum, and atmospheric roller. In the case of dried whole milk, only one grade was established, namely, Extra.

In May 1943, the Dairy and Poultry Branch, Food Distribution Administration, issued in mimeograph form, tentative grade standards for dried skim milk and dried whole milk, identical to those published by the American Dry Milk Institute.⁴⁰ The grade standards for dried skim milk, spray and roller process, consisted of two grades, U.S. Extra and U.S. Standard. They were determined on the basis of the following quality factors: moisture, fat, titratable acidity, sediment, solubility index, bacterial estimate (standard plate count), flavor, color, and texture.

The time consuming "tumbler method" was used to determine the sediment content in dry milk because the large quantity of relatively insoluble material in reconstituted roller process nonfat dry milk solids prevented filtration through a standard lintine disc. The tumbler method consisted of reconstituting a 25-gram sample of nonfat dry milk solids with approximately 250 ml. of filtered water in a 20-ounce glass tumbler. The reconstituted sample was allowed to stand for 5 hours. After 5 hours, the sediment content of the sample was determined by comparing the material observed on the bottom of the tumbler with the ADMI Sediment Standards photoprint for the tumbler method.

In early 1950, D.R. Strobel, Dairy Branch, PMA, designed a study planned to determine whether a satisfactory filtration method for measuring total sediment in roller process nonfat dry milk solids could be developed. He planned to compare results with those of the tumbler in order to determine the method which would provide the most accurate measure of total sediment content.

Strobel first experimented mixing 25 grams of roller powder sample with 100 ml. of pepsin-hydrochloric acid solution, placing them in a 45°C. water bath and holding for 20 minutes; the solution was brought to a boil and filtered immediately. Approximately 0.5 ml. of caprylic alcohol was added as a defoaming agent prior to bringing the sample to a boil. Increasing the time held at 45°C. to 40 minutes and the boiling time to 10 minutes before filtering did not materially affect the sediment content shown on the discs. Heating for 20 minutes at 45°C., bringing to a boil, and filtering, produced satisfactory results with 99 out of 100 samples of roller nonfat dry milk solids.

The application of the regular disc method (reconstituted with warm water and filtered) and the solvent-disc method to 40 samples of spray process nonfat dry milk solids showed that the two methods gave comparable results on duplicate samples. The loss of sediment by digestion in the solvent-disc method was insignificant. Both disc methods gave a more accurate picture of total sediment content when compared with the tumbler method.

Microscopic examination of the discs revealed comparable types of sediment by all methods. Discs of samples of both spray and roller process nonfat dry milk solids showed that in all instances a high percentage of the total sediment content was made up of scorched and burned protein particles.

Tumbler scores were recorded using the ADMI Sediment Standards photoprint for the tumbler method and scored to the nearest tumbler represented on the photoprint. Discs were scored for total sediment to the nearest disc, using the USDA Sediment Standards for Milk and Milk Products, which had been developed in 1949 (see p. 56).

The experimental results were reported by D.R. Strobel and C.J. Babcock in May 1950.⁴¹ They also presented the filtration method at the Forty-fifth Annual Meeting, American Dairy Science Association, Cornell University, Ithaca, N.Y., June 20-22, 1950, which was abstracted in the Journal of Dairy Science (74, p. 408).

To obtain further information and verification of test results, a collaborative study was conducted with the Veterinary Section, Army Medical Laboratory, Army Medical Center, Washington, D.C. Forty-eight samples of roller process nonfat dry milk solids representing 44 different plants were tested for sediment content by using the tumbler and solvent-disc methods. The same testing and grading procedures as previously outlined were used; however, in some instances diglycol laurate was used as a defoaming agent instead of caprylic alcohol.

To determine the practical application and the reproducibility of the solvent-disc method, the American Dry Milk Institute sponsored a project in which the USDA Dairy Branch, the Veterinary Section of the Army Medical Center Laboratory, American Dry Milk Institute Laboratory, and seven commercial laboratories cooperated. Samples for testing were collected by the American Dry Milk Institute and distributed to the participating laboratories. Strobel and Babcock tested 217 samples and like quantities were tested by the other laboratories.

At a meeting of representatives of the American Dry Milk Institute, the Army Medical Center, and the Dairy Branch, the results of the project were presented. It was agreed that the results indicated that the solvent-disc method was accurate and reproducible. This collaborative study, as well as the one conducted with the Army Medical Center, were reported by Strobel and Babcock in the Journal of Dairy Science (75).

As a result of the development of the filtration method and the determination that the material, previously referred to as sediment in dried milk, was largely scorched protein, there was a need for more representative standards than the ADMI Sediment Standards or the USDA Sediment Standards for Milk and Milk Products.

Accordingly, Strobel and Babcock formulated a set of standards for scorched particles in dried milks which were published in the Federal Register, Dec. 13, 1950, under proposed rule making,⁴² and in final form Feb. 1, 1951, effective Mar. 2, 1951.⁴³

The standards consisted of four discs, representing 7.5 mg.; 15.0 mg.; 22.5 mg.; and 32.5 mg. of scorched particles. These standards provided an adequate range for the grading of all dried milks. Any test disc falling between two standard discs was assigned the higher score. Directions were given for the preparation of the standard discs. To facilitate their use and availability a visual aid in the form of a composite sepia photograph, of the four discs was prepared by Elbridge C. Purdy, USDA photographer, at the direction of Strobel. The new scorched particle standard was adopted by the American Dry Milk Institute for industry-wide use. The project was reported by Strobel and Babcock in 1950.⁴⁴

U.S. Standards for Grades of Nonfat Dry Milk Solids were developed by Strobel and Babcock in 1951, and superseded that part of the Tentative U.S. Standards for Grades of Dried Skim Milk and Dried Whole Milk approved May 14, 1943. The standards were published in the Federal Register, Mar. 14, 1951, under proposed rule making.⁴⁵ and in final form June 8, effective July 8, 1951.⁴⁶ The major change in the revised grade standards of 1951 was the replacement of "sediment" as a quality factor by "scorched particles" and the establishment of maximum scorched particle content for each grade for spray and roller process product. The maximum level for U.S. Extra Grade was set at 15.0 mg. and for U.S. Standard Grade 22.5 mg. for spray process product; and not more than 22.5 mg. for U.S. Extra Grade and 32.5 mg. for U.S. Standard Grade, for roller process product.

In the early part of 1951, other experiments were undertaken by Strobel to develop a more rapid method of filtering roller process nonfat dry milk solids than the pepsin-hydrochloric acid method. He placed 200 ml. of a hot (80° - 90°C.) 10 percent sodium citrate solution in a mixing jar of a high-speed mixer, added 25 grams of sample, and mixed for 30 seconds and filtered. This method produced satisfactory results with 99 out of 122 samples. Eighteen of the twenty-three samples that failed to filter contained scorched material in excess of the 32.5 mg. disc of the USDA Scorched Particle Standards for Dry Milks. The application of the sodium citrate method and the solvent-disc method to 80 samples of roller process nonfat dry milk solids indicated the sodium citrate method to be the more rapid and accurate of the two methods.

A cooperative project, conducted by D.R. Strobel, W.G. Bryan, and C.J. Babcock, using the USDA Bureau of Dairy Industry Laboratory, Washington, D.C., the Dairy Branch Laboratory at Chicago, and the Veterinary Section, Army Medical

Laboratory, Army Medical Center, Washington, D.C., proved the sodium citrate method to be practical and reproducible. The three laboratories tested parts of the same 100 samples and obtained the same results on 91 percent of the samples. Incomplete filtrations were obtained by the three laboratories on 8 to 19 samples. In all instances, the discs of the incompletely filtered samples showed an excessive amount of (32.5 mg. or more) scorched particles when compared with the USDA Scorched Particle Standards for Dry Milks. The results of this test procedure were reported by Strobel, Bryan, and Babcock in 1951 (77).

There had been an unusual increase in milk production in 1953, and the expected result was that increased quantities of dairy products would be offered to the Commodity Credit Corporation under the price support program for milk and butterfat. It was anticipated that this would make it necessary for the CCC to accept larger quantities of roller process nonfat dry milk solids. Because the moisture requirements for purchase under the price support program were lower than under the standard, the dry milk contained somewhat more scorched particles.

The American Dry Milk Institute, therefore, urged the Department to amend the standards for U.S. Extra Grade (roller process) by increasing the permitted scorched particle content. They proposed that the scorched particle content be increased from 22.5 mg. to 32.5 mg. The suggested amendments to the grade standards was published in the Federal Register, Mar. 25, 1953, under proposed rule making.⁴⁷

Further study and consideration of the proposal indicated that a more practical method to accomplish the objective appeared desirable. Strobel and Babcock approached the problem by decreasing the sample size from the normal 25 grams to 17 grams and retaining the maximum allowance of 22.5 mg. of scorched particle content for U.S. Extra Grade. The use of a 17 gram instead of a 25 gram sample facilitated the testing of this product. The final form of the amended standards was published in the Federal Register, May 8, 1953, effective as of that date.⁴⁸ The change was necessary immediately to facilitate the carrying out of the Department's price support program. All nonfat dry milk acquired under the price support program had to be inspected and graded.

Outbreaks of Gastroenteritis and Subsequent Actions

Between Jan. 23 and Feb. 21, 1956, there were reported 19 separate outbreaks of acute gastroenteritis among children participating in the school lunch program in Puerto Rico. The outbreaks were reported from 16 schools, three having experienced two such episodes (36). Seven similar outbreaks of food poisoning were reported at the same time in St. Thomas, Virgin Islands.

An investigative team from the U.S. Public Health Service and the U.S. Department of Agriculture, together with local health authorities, established that nonfat dry milk bought by USDA for the School Lunch Program was the cause in the food poisoning outbreaks. The dry milk originated from

several Midwest plants. Samples from dry milk on hand in the schools in Puerto Rico were examined and found to meet the requirements for U.S. Extra Grade. Direct microscopic clump counts were run on the samples and the counts were found to range from eight million to 1,600 million per gram.

In the judgment of the investigators, the outbreaks were caused by a toxin resulting from bacterial growth in the fluid product prior to drying. That raised the question as to whether the standard plate count used in the grading procedure was a satisfactory index of sanitary quality. Accordingly, it was suggested by the investigators that studies be made correlating plant practices with a direct microscopic count (DMC), with a view of developing a direct microscopic standard for dry milk plants.

To prevent a recurrence of food poisoning outbreaks, there was a compelling need for the Food Distribution Division, of USDA, Agricultural Marketing Service (AMS), which distributed the dry milk to schools, to employ additional safeguards. Based upon Department experience with the plant survey program and the DMC test on dry milk, it was concluded that a DMC level of 75 million or less would provide reasonable safeguards. This level was established for milk purchased for the School Lunch Program, effective Oct. 1956.⁴⁹

On Oct. 29, 1956, representatives of the Dairy Division, AMS, met with members of the Research and Standards Committee of the American Dry Milk Institute at Atlantic City, New Jersey.⁵⁰ At this time, the Department outlined suggested changes in the grade standards for nonfat dry milk, including the incorporation of the direct microscopic clump count test. The Department stated its conviction that the grade standards in effect at that time were inadequate, inasmuch as approximately 98 percent of the spray process nonfat dry milk offered under the price-support program qualified as U.S. Extra Grade, despite the extreme wide range in quality of the raw milk and plant operations. Instead of accepting this as a weakness in the grade standards, industry representatives felt that such performance was a compliment to the industry.

The Dairy Inspection and Grading Division, Dairy Branch, AMS, under the leadership of Bennett J. Ommodt and Harold E. Meister, carried out 56 special plant surveys in late 1956 and early 1957, primarily in seven Mid-West states, to determine the range of conditions under which nonfat dry milk was being manufactured in the important production areas of the United States. Direct microscopic clump count tests were run on line samples, including the finished product of these plants.

In most instances there was a direct relationship between the DMC count of the finished product and the quality of the raw milk and/or hygiene of manufacture.⁵¹ Wherever plant practices were satisfactory and the quality of the raw milk was good, the DMC count of the finished product was well below 75 million per gram. On the other hand, when the quality of the incoming milk was poor and/or the plant operations were unsatisfactory, the DMC of the dry product was high, exceeding a 100 million to a billion or more.

These findings reinforced the concern that the grade standards then in effect for nonfat dry milk did not properly reflect the extreme wide range in quality of the raw material being used and the existing deficiencies in many plant operations.

With the rapid expansion of production of nonfat dry milk and the growth of its use for beverage purposes, it was natural that the bacterial quality of this product be given greater attention. The standard plate-count method for estimating the bacterial content of nonfat dry milk measures the number of living bacteria, but does not adequately reflect differences in the quality of raw milk used and/or hygiene of manufacture. Even though processing results in the destruction of large numbers of bacteria so that the finished product has a low count of viable bacteria, one cannot ignore the influence of the products of bacterial metabolism which may adversely affect quality.

A conference with eight representatives of the American Dry Milk Institute was held on Jan. 7, 1957, to discuss proposed revisions in the nonfat dry milk grade standards.⁵² The ADMI representatives objected to inclusion of the DMC test as a grade factor, contending that the test was not sufficiently reproducible. They suggested that until the DMC test was sufficiently reproducible, quality improvement should be carried forward by the Department through its plant survey program. The Department contended that while the plant survey program was an extremely valuable adjunct to quality improvement, the DMC test of the finished product was important in determining the effectiveness of the survey program in maintaining a satisfactory plant operation. The Department continued to point out that grade standards that allow product produced under widely varying conditions to qualify for the top grade are unfair and unrealistic and not in the best interest of the dairy industry and the consuming public.

In Feb. 1957, the Dairy Division held a series of eight conferences, from coast to coast, outlining to members of the industry and users of the product suggested changes in the grade standards, including the addition of DMC levels for U.S. Extra Grade (75 million per gram) and U.S. Standard Grade (150 million per gram).⁵³ Charts were presented showing the correlation between the DMC of the raw milk and the finished product at various levels. The following is the summary of figures which were presented:

Average DMC Raw Skim Milk Per Milliliter	Average DMC Nonfat Dry Milk Per Gram
3.4 million	25.8 million
8.0 million	56.0 million
17.2 million	137.4 million
33.7 million	204.7 million
66.0 million	374.0 million
229.0 million	1,151.0 million

The above data were prepared from the 56 plant surveys. The raw skim milk represented product from 271 creameries because some plants received milk from several supplying creameries.

Robert J. Remaley, staff representative of ADMI, attended all eight conferences and consistently opposed the incorporation of the direct microscopic clump count in the grade standards for the following reasons:

- (1) There were insufficient data to delineate the public health significance of direct microscopic counts as applied to nonfat dry milk;
- (2) The methods of determining DMC were not precise enough to be used as a basis for standards;
- (3) There were insufficient data to incorporate in the milk standards specific levels of direct microscopic clump count; and
- (4) The proposed standard would discriminate against nonfat dry milk, because similar standards could not be applied to other manufactured products, in spite of the fact that these products were commonly made in the same or similar plants from milk having the same bacteriological quality.

In regard to Item 1, public health significance, the Department called to ADMI's attention a parallel situation with respect to the standard plate count as set forth in a study conducted by the National Research Council, which read, in part:

A total bacterial plate count of not more than 200,000 per ml. is recommended empirically as a standard at the receiving plant. There is no exact scientific or public health basis for deciding on this definite bacterial standard other than the fact that experience has shown that this common standard can be readily attained with reasonable facilities and good methods of production. (41, p. 123)

Regarding Item 2, the problem of reproducibility among industry laboratories was admitted, since the DMC test application to nonfat dry milk was relatively new. The Department also pointed out the general lack of standardized procedures and proper laboratory equipment, and a need for specialized training and additional experience among technicians.

With respect to Item 3, lack of data to support specific levels of the direct microscopic clump count, the Department emphasized that the 75 million per gram level for U.S. Extra Grade was consistent with what could be expected with a good quality milk supply and satisfactory plant practices, as revealed by numerous USDA plant surveys.

Regarding Item 4, discrimination against nonfat dry milk, it was pointed out that there were important differences between the manufacture of nonfat dry milk, and other dairy products. In the manufacture of nonfat dry milk there were often delays in the handling and processing of the raw skim milk, causing quality deterioration which was not reflected in the grade of the finished product. In contrast, cream for the manufacture of butter and milk for cheesemaking were usually handled and processed without delay. Furthermore, the organoleptic examination of butter and cheese more adequately reflects differences in quality of raw material and plant practices, and to some extent hygiene of manufacture.

The Department, at each of the conferences, pointed out that in 1956 New Zealand had added a provision for DMC in its nonfat dry milk grade standards. The provision prohibited any nonfat dry milk from being used for beverage purposes that possessed a DMC of over 10 million per gram.

The Board of Governors of the American Bakers Association, at a meeting held in Hollywood, Fla., Mar. 22, 1957, passed a resolution supporting the Department's proposed grade standards. On Apr. 18, E.E. Kelley, Jr., President of the American Bakers Association, addressed a letter to Secretary of Agriculture Ezra Taft Benson urging him to support the resolution.⁵⁴ Secretary Benson was advised by Kelley that copies of the resolution had been sent to the members of the House Committee on Agriculture and to the members of the Senate Committee on Agriculture and Forestry. Further interest in and support of the proposed grade standards was evidenced in Nov. 1957 by Howard O. Hunter, President, American Institute of Baking, Chicago, who requested information as to the progress and status of the proposed standards.

The Commodity Stabilization Service, USDA, in its Apr. 1, 1957, purchase specification for nonfat dry milk under the price-support program, stipulated that product containing a DMC in excess of 300 million per gram, as evidenced by a USDA grading certificate, would not be eligible for sale to the Government.⁵⁵ A reduced DMC level has been stipulated in subsequent purchase announcements, consistent with the maximum allowance contained in the U.S. grade standards.

On Apr. 2, members of the AMS Dairy Division had a conference with six representatives of the Agricultural Research Service, USDA, to discuss the application of the DMC test to nonfat dry milk.⁵⁶ The following question was put to the ARS scientists: "What is wrong with using the DMC test as a grading standard to ferret out quality?" In responding, they stated they could not see anything wrong with the application of the DMC test as a grading standard and that the Dairy Division should pursue this approach.

At another meeting that April, with representatives of the American Dry Milk Institute, Hadrath, President, of ADMI, stated that as a result of the Department's interest in the use of the DMC test, the industry had made much progress in quality improvement.⁵⁷ He admitted that they still had a long way to go, particularly in some producing areas. He added further that the industry was ready to do something and recognized the need for a product test or tests that were meaningful.

A collaborative study was developed and initiated by the Department in the late summer of 1957 to gain as much information as possible concerning the reproducibility of the direct microscopic clump count test for nonfat dry milk (46;82). Twenty-four laboratories, including those of industry, Government, colleges, and the USDA laboratory in Chicago, participated in the study. At four of the industry laboratories Federal technicians were stationed, each of whom operated under the supervision of the USDA Chicago laboratory. This study showed considerable variation in test results among laboratories. However, it also demonstrated that reproducible results could be achieved with adequately trained and experienced technicians, and proper equipment. The four Federal resident technicians and the three technicians in the Chicago laboratory, all of whom came closest to meeting the test essentials, had much more precise results than the technicians representing the other laboratories.

In Nov. 1957, the four resident technicians were selected to take part in a second study. New lots of nonfat dry milk with four different levels of bacterial content (62-224 million per gram) were made up and sent to each of the resident technicians. Each technician received 25 different samples from each level and prepared one slide from each sample using the Aniline-oil Methylene Blue stain. Samples were also analyzed by the three technicians in the Chicago laboratory.

In this second study, there was considerable improvement in reproducibility, and the average coefficient of variation in the tests of the four levels was 19 percent on an intralaboratory basis and 26 percent on an interlaboratory basis. The three technicians in the Chicago laboratory checked very closely with each other in both studies, and their tests showed an average coefficient of variation of approximately 12 percent in studies. This group of technicians possessed the greatest amount of training and experience in running direct microscopic clump counts on nonfat dry milk. On balance, the Department took the position that when technicians in the various laboratories became sufficiently skilled and employed standardized techniques in making DMC tests of nonfat dry milk, reasonable precision and accuracy between laboratories could be achieved.

With all of this background, Edward Small and Floyd Fenton revised the grade standards for nonfat dry milk and published them in the Federal Register, Apr. 10, 1958, under proposed rule making.⁵⁸ The principal changes were: (1) separation of the standards for spray and roller process; (2) more detailed terminology; (3) nonassignment of a U.S. grade when the "direct microscopic clump count" exceeded 300 million per gram; and (4) provision for a heat treatment classification as a supplement to the standards for spray process. After consideration of all relevant matters presented, during the comment period, the standards were published in the Federal Register, May 23, 1958, effective July 1, 1958.⁵⁹ These standards were the same as published under proposed rule making.

The grade standards were amended to lower the DMC limit to 200 million per gram in a proposed rule making published in the Federal Register, Jan. 15, 1959.⁶⁰ The proposed figure was raised in final form to 250 million per gram and the amended standard was published in the Federal Register, Feb. 25, 1959, effective Apr. 1, 1959.⁶¹

In 1960, the American Dry Milk Institute recommended that the Department join ADMI in a collaborative study of the direct microscopic clump count method to determine, as a measure of progress, the variability in results within and between laboratories since comparable studies were made by ADMI and USDA in 1958. The results were comparable to those of the 1958 study (62).

Some bakers began to require spray process nonfat dry milk with increased water absorption capacity. The heat treatment necessary to attain such increased water absorption capacity could cause a rise in the solubility index of the product which would not affect the baking quality. Therefore, the maximum solubility index levels in the grade standards appeared to be too restrictive for bakery-type nonfat dry milk.

The grade standards were accordingly amended by Small and Fenton and published in the Federal Register on May 17, 1962, under proposed rule making,⁶² and in final form, June 30, effective Aug. 1, 1962.⁶³ The amendment applied to product classified as "high-heat," allowing a maximum solubility index of 2.0 ml., instead of 1.2 ml., for U.S. Extra Grade; and a maximum of 2.5 ml., instead of 2.0 ml., for U.S. Standard Grade.

From the time the DMC test was introduced in 1958 for evaluating the quality of nonfat dry milk, the Department continued to monitor industry performance and, on the basis of gradual improvement, the maximum DMC levels were lowered accordingly.

In 1964, the grade standards were amended to reduce the DMC allowance from 250 million to 200 million per gram and published in the Federal Register, Aug. 4, under proposed rule making.⁶⁴ The amendment was published in final form Dec. 30, 1964, effective Apr. 1, 1965.⁶⁵

In 1968, the grade standards were again amended, this time to lower the DMC allowance to 150 million per gram. The proposal was published in the Federal Register, Dec. 11, 1968,⁶⁶ and the amendment as proposed was promulgated and published in the Federal Register, Mar. 12, 1969, effective Oct. 1, 1969.⁶⁷

Because of continued improvement in the quality of manufacturing grade milk at the farm and in handling procedures and sanitary practices during manufacturing, most of the nonfat dry milk produced by the end of 1972 did not exceed a DMC count of 100 million per gram. For instance, in the period from Oct. 1969 to Sept. 1972, USDA officially graded approximately 53 percent of the U.S. production and found 97.4 percent of the nonfat dry milk graded to be below 100 million. For the period Jan. to Sept. 1972, 99.3 percent of the nonfat dry milk officially graded was below 100 million. The DMC requirement in the standards has been a stimulus for improving nonfat dry milk quality, and continues to serve a useful purpose in providing a product of good quality for the market.

A further reduction of the DMC allowance, to 100 million per gram, was proposed in the Federal Register, Nov. 29, 1972.⁶⁸ Several letters were received by the Department in which industry took exception to the more rigorous requirement, on the grounds that the reduction was too drastic; questioned the public health significance or useful purpose of such a requirement; and also questioned the precision and accuracy of the technique for determining the DMC for nonfat dry milk. These were the same arguments originally presented by industry when the DMC requirement was initiated in 1958.

The Department considered its earlier studies had shown that the precision and coefficient of variation for inter- and intra-laboratory testing were within the limits considered acceptable for other microbiological techniques, a proficiency achieved through adequately trained and experienced technicians, proper equipment, and supervision. The success of the DMC techniques was evidenced by the consistency of results on the finished product with the quality of the raw milk from which it was produced and the hygiene of

manufacture. Furthermore, the USDA surveillance program of its own testing laboratories showed that consistency of results could be obtained using the DMC test. This technique was accepted in the thirteenth edition of Standard Methods for the Examination of Dairy Products published by the American Public Health Association in 1972.

Upon consideration of industry capability and the general quality level of nonfat dry milk produced in the United States, the Department amended the standards as proposed, reducing the DMC from 150 to 100 million. The amendment in final form was published in the Federal Register, Mar. 2, 1973, effective Apr. 1, 1973.⁶⁹

Improved Visual Aid Developed

For many years, USDA used sepia photographs as a visual aid in classifying scorched particle discs for dry milks. However, sepia photographs tended to darken with age and consequently they were not always usable. In addition, the equipment for the reproduction of the standard by the photographic process was no longer available. Joseph Rubis, Richard Webber, and Roland Golden, Dairy Division, AMS, in the summer of 1974, took steps to have the standard reproduced by a printing method.

The Division's Chicago Laboratory produced a series of standard discs which fell within the range of the official standards, using the official procedure originally published in 1951. Bernadette Connellly and Jim Dizikes of the Chicago Laboratory and Warren S. Clark, American Dry Milk Institute, compared the new standard discs to the sepia photograph. The results of the comparison showed no significant change from the prevailing official standards.

A composite print, with a white or light background instead of a brown background (sepia), was prepared, showing four standard discs which contain 7.5, 15.0, 22.5, and 32.5 milligrams, respectively, of scorched particles. These levels represent limits of scorched particles allowed by U.S. grade standards for regular and instant nonfat dry milk, dry whole milk, dry buttermilk, dry whey, and other dairy products. To qualify for the U.S. Extra Grade, for example, nonfat dry milk may contain not more than 15.0 milligrams of scorched particles. The scorched particle content of a dairy product can be evaluated by comparing the four standard discs pictured in the composite print with a laboratory sample disc of the product being examined.

In the spring of 1975, the Division made arrangements with the John Henry Company, East Lansing, Mich., to process several hundred composite prints. The supply of these prints was made available for distribution during July 1975.⁷⁰

GRADE STANDARDS FOR DRY WHOLE MILK

The first standards for dry whole milk published by USDA were contained in the Tentative U.S. Standards for Grades of Dried Skim Milk and Dried Whole Milk, effective May 14, 1943. They were identical to the standards formulated

by the American Dry Milk Institute. The standards covered only one grade of dried whole milk, namely, U.S. Extra Grade. This grade was determined on the basis of flavor and odor, physical appearance, and the following quality factors that were subject to quantitative measurement: butterfat, moisture, acidity, bacteria, solubility index, and sediment. Separate minimum specifications were established for spray, vacuum, and roller-dried whole milk.

In 1954, C.J. Babcock and D.R. Strobel drafted the revision of the 1943 standards for dry whole milk.

The revised standards included three grades: U.S. Premium, U.S. Extra, and U.S. Standard. The U.S. Premium Grade was limited to spray process product, whereas U.S. Extra Grade and U.S. Standard Grade were applicable to spray or roller-process product. Raw milk requirements were established for U.S. Premium Grade. The grades were determined on the basis of flavor, physical appearance, bacterial estimate, butterfat content, coliform content (applied only to U.S. Premium Grade), copper content, iron content, moisture content, oxygen content (if gas packed, applied only to U.S. Premium Grade and U.S. Extra Grade), solubility index, scorched particle content, and titratable acidity. The test for copper and iron content was not required if equipment surfaces coming in contact with the milk were free of copper, iron or copper alloys.

The revised standards were published in the Federal Register, May 19, 1954, under proposed rule making.⁷¹ Discussions were held with industry members, the Standards Committee of the American Dry Milk Institute, and the U.S. Food and Drug Administration. Subsequently, the revised standards in final form were published in the Federal Register, Aug. 5, effective Sept. 4, 1954.⁷²

In the 1960's the predominant method of pasteurizing milk prior to drying was by the high-temperature short-time method.

In 1970, Floyd Fenton, Eugene McGarrahan, and Richard Webber drafted amendments to the 1954 grade standards for dry whole milk to reference this method of pasteurizing rather than the vat method. In addition, the amended grade standards deleted the raw milk requirements for U.S. Premium Grade, because these requirements were included in the regulations governing provision of grading service. The amended grade standards also updated the references for test methods.

The amended standards were published in the Federal Register, Oct. 16, 1970, under proposed rule making,⁷³ and published in final form in the Federal Register, Dec. 25, 1970, effective Jan. 31, 1971.⁷⁴

GRADE STANDARDS FOR DRY BUTTERMILK

The increasing use of food grade dry buttermilk solids increased the interest in the development of U.S. grade standards for this product. Development of such grade standards necessitated filtration tests to determine

the scorched particle content. Preliminary investigation in 1954 by D.R. Strobel, W.G. Bryan, C.J. Babcock, Dairy Branch, PMA, and George H. Norman, Bureau of Dairy Industry, USDA, showed that the sodium citrate method used for filtering roller process nonfat dry milk solids did not produce a filtrable solution. The pepsin-hydrochloric acid method did, but a more rapid method was needed.

Experiments were undertaken to develop a rapid method of filtering roller process dry buttermilk solids. Several dispersing agents were tried before a successful agent was found. Tetra sodium salt of ethylene diamine tetra acetic acid powder produced a filtrable solution. It was possible to filter 25 grams of the sample when this amount was heated to 175-180°F. in a beaker containing approximately 400 ml. of a 10 percent solution of the dispersing agent; the hot solution, poured into the Waring Blender and agitated for 30 to 45 seconds, filtered immediately.

A shorter and more successful procedure, however, was to:

Place approximately 300 ml. of a hot (175-180°F.) 10 percent solution of the dispersing agent in a Waring-Blendor; add 17 grams of sample and turn on the mixer. Add a few drops of a defoaming agent (caprylic alcohol or diglycol laurate) and mix 8 to 10 seconds. Add hot solution to the mixer to bring the volume to approximately 500 ml. This is the maximum amount of solution that can be agitated in the blender without spillage. Agitate the sample for 45 seconds and filter immediately through a 1 1/4 inch lintine disc using an aspirator type laboratory tester.⁷⁵

Fifteen of 19 samples from different plant sources were successfully filtered by the hot solution method. Of four samples that failed to filter, all contained scorched material far in excess of 32.5 mg. It was found that a 5 percent solution did not successfully filter 17 grams of sample, and that 15 and 20 percent solutions produced a gelatinous material that clogged the pads and prevented filtration. It was also found that 20 grams of sample using the 10 percent solution method failed to filter.

Strobel and Babcock conducted additional experiments employing the shorter filtration method as outlined above, involving 33 samples from different plant sources, with equally successful results. Samples were also successfully filtered by this method at the American Dry Milk Institute Laboratory and at the Dairy Division Chicago Laboratory. The results of the latter experiments were reported by Strobel and Babcock in 1954 (76).

In the formulation of the grade standards for dry buttermilk, the limits of all of the quality factors were thoroughly discussed by Strobel and Babcock with representatives of the industry, and all information available on the product was fully studied. The grade standards as developed by Strobel and Babcock, in response to industry and the American Dry Milk Institute, were published in the Federal Register on May 8, 1954, under proposed rule making,⁷⁶ and in final form June 30, effective July 30, 1954.⁷⁷

Two grades were established, U.S. Extra and U.S. Standard. The grade standards for dry buttermilk were based on flavor, physical appearance, alkalinity of ash, bacterial estimate, butterfat content, moisture content, scorched particle content, solubility index, and titratable acidity. The standards contained specifications applicable to dry buttermilk manufactured by the spray and roller process.

In the late 1960's Floyd Fenton, Eugene McGarrahan, and Richard Webber researched and studied the need to revise the 1954 grade standards for dry buttermilk, based on information received or developed by USDA. The revised standards were published in the Federal Register, Oct. 21, 1970, under proposed rule making,⁷⁸ and in final form Dec. 25, 1970, effective Jan. 31, 1971.⁷⁹ The alkalinity of ash test was made optional rather than mandatory; the reference to the pasteurization temperature and holding time was changed from 143°F. for 30 minutes to 161°F. for 15 seconds; and references for test methods were updated.

GRADE STANDARDS FOR DRY WHEY

In 1953, the cheese industry expressed a desire to have USDA develop grade standards for dry whey to encourage its use as a food product. Members of the cheese industry pointed out that dry whey was recognized in the Standards of Identity for Bread and Cheese Foods by the Federal Food and Drug Administration and that dry whey was being used as a filler and binder for processed meats and sausage, in some cases as a "60-40" blend of dry whey and nonfat dry milk.

After a thorough study of the problems involved and the relevant quality characteristics, and discussions and recommendations of members of the industry and the Quality Committee of the National Cheese Institute, Babcock and Strobel developed quality standards for food grade dry whey. The standards were published in the Federal Register, Apr. 17, 1954, under proposed rule making,⁸⁰ and in final form, June 8, effective July 8, 1954.⁸¹ Only one grade was established, U.S. Extra. The grade was determined on the basis of flavor, physical appearance, bacterial estimate, butterfat content, alkalinity of ash, moisture content, scorched particle content, solubility index, and titratable acidity.

In 1970, Floyd Fenton, Eugene McGarrahan and Richard Webber prepared a revision of the 1954 grade standard for dry whey. The revision contained two changes: (1) the replacement of the pasteurization temperature of 143°F. for 30 minutes with 161°F. for 15 seconds, reflected the predominant method of pasteurizing liquid whey prior to drying, and (2) changing the alkalinity of ash test from a mandatory to an optional requirement, consistent with the prevailing methods of production and utilization of dry whey. The revised standard was published in the Federal Register, Oct. 21, 1970, under proposed rule making,⁸² and in final form Dec. 25, effective Jan. 31, 1971.⁸³

GRADE STANDARDS FOR INSTANT NONFAT DRY MILK

Manufacturers of nonfat dry milk and dairy research workers began working in the mid-1950's to develop a nonfat dry milk which would dissolve more rapidly and completely in water. Such a product was developed in the late 1950's and early 1960's, and successfully marketed.

The nature of the product, however, was such that the conventional grade standards of nonfat dry milk were not fully applicable. Intensive and extensive investigations were made regarding the quality and performance characteristics of instant nonfat dry milk, including a series of nationwide market surveys in 1958, 1960, and 1962. Several conferences were held with representatives of the dry milk industry.

The American Dry Milk Institute established tentative standards for instant nonfat dry milk in 1958, with the understanding that they would be revised, where necessary, to correspond with the grade standards being developed by USDA, consistent with market survey findings.

These standards, formulated by Edward Small and Floyd Fenton, were published in the Federal Register, Feb. 2, 1963, under proposed rule making,⁸⁴ and were strongly endorsed in comments from industry, consumers, and other interested parties. They were published in final form in the Federal Register, Mar. 26, effective May 1, 1963.⁸⁵

The standards as promulgated were based on organoleptic examination for flavor and physical appearance; and laboratory testing to determine classification of the following quality characteristics: bacterial estimate, coliform count, milkfat content, moisture content, scorched particle content, solubility index, titratable acidity, and dispersibility. Specific acceptable levels were established for each of these attributes to attain a rating of U.S. Extra Grade.

The standards provided that a grade of U.S. Extra would not be assigned to any instant nonfat dry milk if the product: (a) had a direct microscopic clump count exceeding 75 million per gram or showed a phosphatase test of more than 4 micrograms of phenol per ml. of reconstituted nonfat dry milk.

Since the standard was originally developed, the manufacture of mechanical equipment previously used for determining dispersibility had been discontinued in late 1967 or early 1968. The Market Quality Research Division, Agricultural Research Service, USDA, developed a nonmechanical method for determining the dispersibility of nonfat dry milk. This method, called the Moats-Dabbah method, was published in Apr. 1968 (58). As a result of subsequent tests by USDA, ADMI, and dry milk industry members, certain changes in the method were suggested to improve its reproducibility and use, and the method was modified accordingly. The Modified Moats-Dabbah Method for Determining Dispersibility of Nonfat Dry Milk, which effectively differentiates between regular and instant nonfat dry milk was agreed upon by the Dairy Division and the American Dry Milk Institute.

Accordingly, the standards were revised by Floyd Fenton, Eugene McGarrahan, and Richard Webber and published in the Federal Register, May 20, 1970, under proposed rule making,⁸⁶ and in final form July 29, effective Oct. 1, 1970.⁸⁷

The revised standards contained the following changes: (1) reduction of the bacterial estimate to not more than 30,000 per gram; (2) reduction of the coliform count to not more than 10 per gram; (3) dispersibility requirement for U.S. Extra Grade expressed as 85 percent instead of 44.0 grams (based on Harland-Ashworth method); (4) testing for phosphatase activity at the option of the Department or when requested by the buyer or seller; and (5) Modified Moats-Dabbah Method referenced as the test for measuring dispersibility.

GRADE STANDARDS FOR EDIBLE DRY CASEIN (ACID)

Casein, a component of milk, grew in importance in the 1960's as a supplement in other food products to improve their nutritional qualities. Casein is a basic product for the manufacture of sodium caseinate, a compound being used more extensively in numerous food products. Until recent years, casein for edible purposes was obtained by reprocessing and refining industrial-type casein used in the paint and paper industries, and for other industrial uses. Practically all of the casein used is imported from foreign countries.

The Department considered that the growing importance of casein for edible purposes warranted the issuance of grade standards which would reflect the quality characteristics of an acceptable food product. In developing the standards, Floyd Fenton, Robert Anderson, and Richard Webber researched the literature, received technical advice from several members of the industry, and obtained copies of specifications from buyers and processors, as well as standards in effect in New Zealand and Canada. Both countries export considerable quantities of casein. This information, together with the experience and technical knowledge within the Department, formed the basis for the establishment of the grade standards for edible dry casein (acid).

The grade standards were published in the Federal Register, Dec. 14, 1967, under proposed rule making,⁸⁸ and in final form July 20, 1968, effective Sept. 1, 1968.⁸⁹ Edible dry casein (acid) was defined in the standards as the ground or unground product resulting from washing, drying, or otherwise processing the coagulum resulting from acid precipitation of skim milk which had been pasteurized before or during the process of manufacture in a manner approved by USDA. In addition, it was required that the product be produced in a plant under conditions suitable for the manufacture of human food and packaged in a container which would prevent contamination, deterioration and/or development of a public health hazard under normal conditions of storage and transportation.

Two grades were established, U.S. Extra and U.S. Standard. The grade standards were based on flavor, physical appearance, bacterial estimate, coliform count, protein content, moisture content, milkfat content, extraneous materials, and free acid. In addition, the standards provided for optional tests for particle size, Salmonella or Staphylococcus, metals (copper, lead or iron), yeast and mold, and thermophiles or reducing sugars, at the request of the applicant for the service or at the option of the Department.

- ¹ Fistere, Charles M. Federal Regulation in the Field of Identity, Quality and Sanitary Standards for Milk and Milk Products. Paper presented at Thirteenth Annual Meeting of the Dairy Products Improvement Institute, 13 pp., New York City, Feb. 18, 1960.
- ² Roy C. Potts to Charles J. Brand, May 20, 1918, Bureau of Markets General Correspondence. Record Group 83, National Archives.
- ³ Roy C. Potts to Charles J. Brand, June 17, 1918, Bureau of Markets General Correspondence. Record Group 83, National Archives.
- ⁴ Harry W. Redfield to Charles J. Brand, May 13, 1919, Bureau of Markets General Correspondence. Record Group 83, National Archives.
- ⁵ 40 Stat. 1002.
- ⁶ 49 Stat. 1491.
- ⁷ Notes taken by the author.
- ⁸ Not published in the Federal Register. Available at the office of the Poultry and Dairy Quality Division, FSQS, USDA, Washington, D.C.
- ⁹ 3 F.R. 2635.
- ¹⁰ 8 F.R. 1327.
- ¹¹ 17 F.R. 1224.
- ¹² 17 F.R. 3746.
- ¹³ 19 F.R. 1323.
- ¹⁴ 19 F.R. 1693.
- ¹⁵ 24 F.R. 8550.
- ¹⁶ 25 F.R. 713.
- ¹⁷ 41 F.R. 49826.
- ¹⁸ 42 F.R. 5968.
- ¹⁹ Handbook for the Inspection of Whole-Milk American Cheese Under the Food Products Inspection Law. Office of the Secretary, U.S. Dept. Agr., Circular 157, Jan. 1923.
- ²⁰ Not published in the Federal Register. Available at the office of the Poultry and Dairy Quality Division, FSQS, USDA, Washington, D.C.

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- 24 19 F.R. 2676.
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- 26 Letter of E. Small, Nov. 29, 1955, to Harvey Weavers, Chief, Dairy Division, Wisconsin Dept. of Agr., Madison, Wis. Available at the office of the Poultry and Dairy Quality Division, FSQS, USDA, Washington, D.C.
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- 28 21 F.R. 1889.
- 29 57 Stat. 566.
- 30 Not published in the Federal Register. Available at the office of the Poultry and Dairy Quality Division, FSQS, USDA, Washington, D.C.
- 31 16 F.R. 12399.
- 32 17 F.R. 10386.
- 33 18 F.R. 97.
- 34 31 F.R. 6715.
- 35 31 F.R. 9443.
- 36 36 F.R. 20608.
- 37 36 F.R. 24205.
- 38 37 F.R. 25989.
- 39 37 F.R. 25992.
- 40 Not published in the Federal Register. Available at the office of the Poultry and Dairy Quality Division, FSQS, USDA, Washington, D.C.
- 41 Strobel, D.R., and Babcock, C.J. A Disc Method of Filtration of Roller Process Nonfat Dry Milk Solids, 13 pp., May 1950. Available at the office of the Poultry and Dairy Quality Division, FSQS, USDA, Washington, D.C.
- 42 15 F.R. 8827.
- 43 16 F.R. 923.
- 44 Strobel, D.R., and Babcock, C.J. Scorched Particle Standards for Dried Milks Developed, 6 pp., Dec. 1950. Available at the office of the Poultry and Dairy Quality Division, FSQS, USDA, Washington, D.C.
- 45 16 F.R. 2398.
- 46 16 F.R. 5420.
- 47 18 F.R. 1692.
- 48 18 F.R. 2663.

- 49 History and Background of the Direct Microscopic Clump Count for Nonfat Dry Milk, 13 pp., typewritten, Jan. 28, 1958. Available at the office of the Poultry and Dairy Quality Division, FSQS, USDA, Washington, D.C.
- 50 Ibid.
- 51 Ibid.
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- 54 Ibid.
- 55 U.S. Dept. Agr., Press Release, USDA 468-57, Feb. 9, 1957.
- 56 History and Background of the Direct Microscopic Clump Count for Nonfat Dry Milk, 13 pp., typewritten, Jan. 28, 1958.
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- 58 23 F.R. 2349.
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- 61 24 F.R. 1363.
- 62 27 F.R. 4692.
- 63 27 F.R. 6187.
- 64 29 F.R. 11192.
- 65 29 F.R. 19091.
- 66 33 F.R. 18379.
- 67 34 F.R. 5099.
- 68 37 F.R. 25238.
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- 70 U.S. Dept. Agr., Press Release, USDA - 2214-75, July 29, 1975.
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- 74 35 F.R. 19630.
- 75 Strobel, D.R., Bryan, W.G., Babcock, C.J., and Norman, George H. Preliminary Report on a Filtration Procedure for Roller Process Dry Buttermilk Solids, 3 pp., June 1953. Available at the office of the Poultry and Dairy Quality Division, FSQS, USDA, Washington, D.C.
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- 79 35 F.R. 19629.
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- 83 35 F.R. 19629.
- 84 28 F.R. 1058.
- 85 28 F.R. 2956.
- 86 35 F.R. 7739.
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THE EVOLUTION OF FEDERAL SPECIFICATIONS

EARLY HISTORY

On June 17, 1910, Congress enacted Public Law 213, which established the General Supply Committee within the Treasury Department.¹ Under the provisions of section 4, the Committee was authorized and directed to purchase or procure and distribute supplies to meet the consolidated requirements of any one or more executive departments and independent establishments of the Government. The word "supplies" as used in the act was construed to mean any article for which the Secretary of the Treasury or the General Supply Committee was authorized under the then existing law to make term contracts.

In the fall of 1921, by direction of the President, Charles G. Dawes, Director of the Budget, Treasury Department, established a Federal Specifications Board.² This Board was established to bring coordination and economy in the procurement of material and services used by the government under specifications prepared in the various branches, to avoid duplication of effort, and to better utilize resources. It was the duty of the Federal Specifications Board to compile and adopt standard specifications for materials and services, and to bring specifications into harmony with the best commercial practice.

The Director of the Bureau of Standards, Department of Commerce, was designated as ex-officio chairman of the Board, and, subject to the approval of the Chief Coordinator for General Supply, was required to select necessary committees and direct the time and place of meetings and the order in which subjects were to be considered. Circular No. 42 required that the head of each department and establishment designate one representative to serve as a member of the Federal Specifications Board and also designate alternates, as he deemed necessary.

The specifications prepared, adopted by the Board, and approved by the Director of the Bureau of Standards, as far as applicable, were binding upon all departments, bureaus, agencies, and offices of the government. In the case of disagreement on specifications or on methods of procedure, the matter was to be submitted to the Chief Coordinator for General Supply, whose decision was final, subject only to appeal to the head of the department concerned.

On Oct. 9, 1933, by the order of the Secretary of the Treasury, the activities of the Federal Specifications Board were transferred from the Federal Coordinating Services to the Procurement Division of the Treasury Department. The Board was superseded on July 16, 1935, by the Federal Specifications Executive Committee, set up by the Director of Procurement under Circular Letter 106, July 16, 1935.³ The Federal Specifications Executive Committee was structured so as to include a Provisions Committee, on a commodity basis, which in turn consisted of a chairman and individual commodity experts.

Circular A-99, dated Aug. 9, 1945, suspended Circular Letter No. 106 and established a new Federal Specifications Board, approved by the Secretary of the Treasury.⁴ The Board consisted of representatives of the following agencies and such other agencies as the Director, Bureau of Federal Supply would from time to time designate:

Treasury Department
War Department
Post Office Department
Navy Department
Interior Department

Agriculture Department
Commerce Department
Veterans Administration
Federal Security Agency
Federal Works Agency

The Federal Specifications Board provided for a Provisions Technical Committee which was broken down into eight Sub-Committees, on a product basis. Sub-Committee No. 3 was assigned to dairy products. B.J. Ommodt, Chief, Dairy Products Section, Dairy and Poultry Inspection and Grading Division, Production and Marketing Administration, was a member of this Sub-Committee which was chaired by Colonel Russell McNellis, until June 1951. The Federal Specifications Board on July 12, 1946, issued an Outline Form that was used to standardize the make-up and phraseology in which purchase specifications within the province of the Board were to be prepared.

During the period 1947 to 1949, the Hoover Commission investigated the whole standards situation in Government. The commission made a series of recommendations which not only led to solution of the standardization problem but simultaneously set up a housekeeping organization known as the General Services Administration (GSA). The Federal Property and Administrative Services Act of 1949, Public Law 152, approved by Congress June 30, 1949, established GSA as an independent agency.⁵

It was the intent of Congress, in enacting this legislation, to provide, for the Government, an economical and efficient system for the procurement and supply of personal property and nonpersonal services, including related functions such as contracting, inspection, and specifications. Public Law 152 did not provide for public hearings. Specifically, the Act made it the responsibility of GSA to establish and maintain a uniform Federal Catalogue System and to develop, maintain, and make mandatory on all agencies of the Government a series of uniform standard purchase specifications, known as Federal Specifications. In addition, the Act laid down the basis for establishing uniform inspection of materials and testing of materials for acceptance, a very important phase of the Federal standards operation.

In effect, the Administrator of GSA was given the general responsibility in the whole area of standardization without regard to the type of item. Under the Act, the functions of the Bureau of Federal Supply in the Department of the Treasury were transferred to the Administrator of GSA. The Federal Specifications Board was abolished in April 1952, and the Provisions Technical Committee was subsequently abandoned in July 1954.

C.J. Babcock, Head, Standards Section, Manufactured Dairy Products Division, Dairy Branch, Production and Marketing Administration, replaced B.J. Ommodt as a member of Sub-Committee No. 3 of the Provisions Technical Committee in June 1951, and remained on the Sub-Committee until May 1954. David R. Strobel served as alternate to Babcock.

On June 22, 1954, Willis S. MacLeod, Director, Standards Division, Federal Supply Service, GSA, asked whether USDA would accept a continuing assignment of responsibility for the development of Federal Specifications covering the general categories of meat and meat products; flour, flour products, and cereals; fresh fruits and vegetables; and poultry and eggs. Dairy products were included in 1955.

On July 21, 1954, John B. Holden, Chief, Division of Procurement and Property Management, Office of Budget and Finance, USDA, responded in the affirmative, advising that the work would be done by the respective standardization commodity branches within AMS.

Acceptance of this continuing assigned responsibility from GSA was consistent with the provisions of the Agricultural Marketing Act of 1946, which authorized and directed the Secretary of Agriculture to develop procurement standards and specifications for agricultural products, for use by, and at the request of, any Federal or State agency. The USDA product specialists assigned to the work were unanimous in their judgment that Federal specifications should not conflict with standards promulgated by Federal agencies pursuant to statutory authority.

The Standardization and Program Development Branch, Dairy Division, AMS, accepted responsibility for preparing specifications for dairy products in May 1955. Edward Small was designated as the Division's representative, working with an Advisory Group to GSA on food products specifications.

The development of a new Federal specification for a dairy product or revising an existing one required consultation with various agencies and industry groups. Contacts with industry were through the respective trade associations and their committees on research, quality specifications, and packaging. Proposed specifications were also transmitted to appropriate technical experts of the U.S. Food and Drug Administration and the U.S. Public Health Service for review and comment. Specifications for packing and packaging were prepared by the Quartermaster Food and Container Institute for the Armed Forces, Chicago, subject to the Dairy Division's review. After the views of the various segments of industry and of other governmental agencies were reconciled, the final draft was transmitted to GSA for publication.

In the late fifties, the Defense Subsistence Supply Center of the Defense Agency, Department of Defense, developed Quality Assurance Provisions, based on statistical sampling plans, and requested GSA to include them in the Federal specifications for subsistence items. This was done for food products intended for delivery to the military. However, AMS did not accept these provisions for food products intended for delivery to civil agencies.

FEDERAL PROCUREMENT REGULATIONS

The General Services Administration established a new Federal Procurement Regulations System on Mar. 17, 1959.⁶ The System was an outgrowth of recommendations of the President's Cabinet Committee on Small Business and the work of the interagency Task Force for Review of Government Procurement Policies and Procedures, established by the Administrator of GSA pursuant to a Presidential directive of Sept. 26, 1956. The System was intended to promote the objectives of eliminating needless inconsistencies between agency procurement regulations, minimizing complexities and inequities in procurement policies and procedures, and making agency procurement regulations more readily available to businessmen and others concerned.

The Federal Procurement Regulations of Mar. 17, 1959, were revised on July 24, 1964, and published in the Federal Register.⁷ Federal specifications were defined as follows:

'Specifications,' as used in these regulations is a clear and accurate description of the technical requirements for a material, product, or service, including the procedure by which it will be determined that the requirements have been met. Specifications for items or materials contain also preservation, packaging, packing, and marking requirements. The identification of categories and intended use of such specifications: (a) Federal. A specification covering those materials, products, or services, used by or for potential use of two or more Federal agencies (at least one of which is a civil agency), or new items of potential general application, promulgated by the General Services Administration and mandatory for use by all executive agencies and (b) Interim Federal. A potential Federal Specification issued in interim form, for optional use by agencies. Interim amendments to Federal Specifications are included in this definition.

Mandatory Use of Federal Specifications

The regulations of 1964 required that all executive agencies use the appropriate Federal Specifications in their procurement programs. This also included the Department of Defense, in the procurement of supplies and services covered by such specifications, except as provided under specified conditions.

Exceptions to Mandatory Use of Federal Specifications

The 1964 regulations did not require the Federal Specifications to be used under the following circumstances:

(a) The purchase is required under a public exigency and a delay would be involved in using the applicable specification to obtain agency requirements; (b) The total amount of the purchase does not exceed \$2,500. Multiple small purchases of the same item shall not be made for the purpose of avoiding the intent of this exception; (c) The purchase involves items of construction for new processes, new installation of equipment, or items for experiment, test, or research and development, until such time as specifications covering them are issued or it is determined by the General Services Administration, and the procuring agencies notified, that further deviations from the Federal Specifications will not be permitted: Provided, That in connection with such deviations, existing Federal Specifications shall be used to the extent that they are applicable; (d) The purchase involves spare parts, components, or materials required for repair or maintenance of existing equipment, or for similar items required for maintenance or operation of existing facilities or installations: Provided, That existing Federal Specifications shall be used to the extent that they are applicable; (e) The items are purchased in foreign markets for use of overseas activities or agencies; (f) An Interim Federal Specification is used by an agency in lieu of the Federal Specification and (g) Where otherwise authorized by law.

REASSIGNED RESPONSIBILITY

Reassignment of the responsibility for the development and maintenance of Federal Specifications for subsistence items from the USDA to DOD had been under consideration for several years. In the early part of 1969, USDA indicated a willingness to relinquish the assignment whenever GSA made the decision. This decision was forthcoming in the fall of 1971 when DOD notified GSA that they would accept responsibility for the development and maintenance of all Federal Specifications in the subsistence area. On Nov. 10, 1971, GSA advised USDA that it was transferring the assignment to DOD. This was done with the understanding that Federal Specifications in the subsistence area would continue to reference USDA grade standards to the extent possible, and also to include U.S. Standards for Condition of Food Containers, the latter applicable to civil agencies. In addition, it was agreed that USDA would be given the opportunity to review and submit comments on each proposed new specification and proposed revision.

GSA also expressed gratitude to all of the food technologists in AMS who had contributed their expertise in the development and maintenance of Federal Specifications in the subsistence area for the period 1954 to 1971.

A number of technologists were involved in the preparation and revision of Federal Specifications for dairy products during the period 1955 to 1971:

Edward Small, Head, Standards Section, Standardization and Program Development Branch, Dairy Division, AMS, May 1955 to June 1961, and Chief, Standardization Branch, Dairy Division, AMS, July 1961, until his retirement in August 1963. Floyd E. Fenton served as an alternate during this time.

Floyd E. Fenton, Chief, Standardization Branch, Dairy Division, AMS, Sept. 1963 to Oct. 1970. Robert F. Anderson, alternate, Sept. 1963 to June 1968. Eugene T. McGarrahan, alternate, Oct. 1968 to Oct. 1970.

Richard W. Webber, Assistant Chief, Standardization Branch, Nov. 1970 to Nov. 1971.

The AMS Dairy Division developed or modified Federal Specifications covering the following dairy products: Butter, natural Cheddar cheese, cottage cheese, cream cheese, grated cheese, pasteurized process Cheddar or American cheese, pasteurized process Swiss-pasteurized process Swiss and Cheddar or American cheese, natural Swiss cheese, fresh cream and half and half, fresh whole milk, fresh skimmed and low fat milk, whole fresh cultured buttermilk, chocolate flavored milk and chocolate flavored drink, cultured or acidified sour cream, evaporated milk, sweetened condensed milk, malted milk, nonfat dry milk, dry whole milk and dry cultured or uncultured buttermilk solids.

FEDERAL PROCUREMENT POLICY ACT

The Federal Property and Administrative Service Act of 1949 was amended by the enactment of the Federal Procurement Policy Act, Public Law 93-400, on Aug. 30, 1974, to establish an Office of Federal Procurement Policy within the Office of Management and Budget.⁸ The amended law provided for the designation of an Administrator for Federal Procurement Policy.

An Interagency Food Quality Assurance Planning Committee was organized to study the effectiveness of the existing Federal procurement program. In addition, two working groups operating under the direction of the Planning Committee were established, namely: the Specifications Task Group, and the Product Testing and Acceptance Task Group. Both task groups completed their work in Mar. 1977 and reported their findings and recommendations to the Planning Committee.

The Department of Agriculture, on the basis of the reports prepared by the two task groups, formulated a Recommended Executive Branch Plan for a Government-wide Food Quality Assurance Program for Food Procured by Federal Agencies, and transmitted it to the Office of Federal Procurement Policy for approval. The Executive Branch Plan stipulated that (1) the Secretary of Agriculture would have authority for quality assurance policies and procedures involving the procurement of food by Federal agencies and (2) the Secretary of Agriculture would have responsibility for Federal Specifications for food items.

The Executive Branch Plan was approved officially by the Office of Federal Procurement Policy on July 29, 1977. Subsequently, USDA initiated action to begin implementation of the plan, which is targeted for completion by Oct. 1, 1979. The administration of the Government-wide Food Quality Assurance Program has been assigned to Food Safety and Quality Service, USDA.

¹ 36 Stat. 531

² Circular No. 42, Oc. 10, 1921. Available at U.S. Treasury Department Library.

³ Circular No. 106, July 16, 1935. Available at U.S. Treasury Department Library.

⁴ Circular A-99, Aug. 9, 1945. Available at U.S. Treasury Department Library.

⁵ 63 Stat. 377.

⁶ 24 F.R. 1933.

⁷ 29 F.R. 10102.

⁸ 88 Stat. 796.

HISTORY AND DEVELOPMENT OF SEDIMENT STANDARDS
FOR MILK AND MILK PRODUCTS

EARLY HISTORY

The testing for sediment in milk began about the turn of the century. During the period 1907-1910, F.O. Tonney, Municipal Laboratory, Department of Health, City of Chicago, utilized apparently for the first time in this country the amount of sediment in milk as a basis for classifying samples, and it is believed that Tonney was the first to develop photographic standards.

In 1910, S.M. Babcock and E.H. Farrington at the University of Wisconsin published a technique and produced a drawing of an early model of the Wisconsin or Lorenz tester constructed by E.H.J. Lorenz, apparently the first to be put on the market in this country. Babcock and Farrington, in their report, published photographs of four discs of "absorbent cotton" representing different amounts of sediment which they classified as "clean," "slightly dirty," "dirty," and "very dirty," suggesting that this test might be used as a basis for paying for milk according to this standard. In 1911 the routine testing of all milk "delivered to the creamery" was started in Wisconsin. By 1912 several types of sediment testers were available.

That same year the State of Connecticut adopted the use of the Wizard sediment tester. The dried sediment disc was returned to the local health official with the report of the results of the test. Later, the practice was adopted of comparing the discs with others made in the laboratory from milk containing known amounts of sediment.

In 1914, M.C. Schroeder published in the American Journal of Public Health the test as developed in the New York City Department of Health, and described various types of testing equipment using gravity, pressure, and suction (69, p.50). Schroeder reproduced a photograph of a gauge which she devised for making comparisons of the sediment obtained from milk. The gauge or charts represented the amount of sediment obtained from filtering liter lots of milk to which had been added respectively 2 1/2, 5, 7, and 10 milligrams of the "material which usually finds its way into milk." She reported that in some cities in Europe, milk containing over 5 milligrams of sediment per liter was considered unfit for food and confiscated. It was Schroeder's technique that was adopted by the American Public Health Association (APHA) in 1921 (23, pp. 20-21).

H.C. Campbell, U.S. Department of Agriculture, in 1916 reported some experiments with various testers and published a photograph of sediment classified as "good," "fair," "medium," and "bad." (39)

In 1927, pint samples, from milk cans that had been stirred for sediment testing by the American Public Health Association method were designated as

standard. Photographic standards were published showing 1.25 mg., 2.50 mg., 3.75 mg., and 5.0 mg. of sediment per pint of milk in Standard Methods of Milk Analysis (30, pp. 32-34). The technique for the method of sediment testing was that commonly used and reported by Schroeder.

By this time, Connecticut's milk supply had improved to a point that practically all the milk was classified as "clean," that is, sediment content was less than 1.25 mg. per pint. If further improvement was to be made, it seemed necessary to provide a finer grading standard. This was done by showing a breakdown of the clean classification into 0.25, 0.50, 0.75, and 1.0 mg. per pint.

In addition, Connecticut health officials specified other requirements to supplement Standard Methods of Milk Analysis. One particular requirement was the use of a photographic standard prepared by the Connecticut State Health Department to compare results of sediment tests, in place of the separate discs prepared by each laboratory. Even though each laboratory followed the same technique in preparing the discs, the Health Department had found too much variation in results. It was felt more uniformity could be obtained from a standard photograph. The modified sediment test was adopted by Connecticut in 1928.

In 1930, Henry Hoffmann, Jr., Minnesota Department of Agriculture, reporting for the Committee on Milk for the Association of Official Agricultural Chemists (AOAC), published a standardized method and procedure for preparing standard sediment discs. This was more detailed than the Connecticut technique in that specific mesh screens (60 and 100 mesh) were mentioned and a 50 percent sucrose solution was used to suspend the material before filtering. This procedure was adopted by the AOAC and published four years later (24, pp. 44-47).

Up to this time, only the mixed sample technique was employed for sediment testing. It was not until 1941 that the off-the-bottom method of sampling for sediment testing was accepted as standard procedure (25, pp. 68-72).

U.S. SEDIMENT STANDARDS FOR MILK AND MILK PRODUCTS

Prior to the fall of 1949, it was necessary to refer to sediment standards issued by some industry organization. The use of such standards by the Department was unsatisfactory because they had limited uses, lacked uniformity, were subject to change without approval of the Department, and did not have official status.

USDA sediment standards were developed by C.J. Babcock and D.R. Strobel, in 1949, to encourage the dairy industry to use a uniform "yardstick" for measuring sediment in milk and milk products. The standards were published in the Federal Register, June 17, 1949, under proposed rule making;¹ and in final form Nov. 2, effective Dec. 2, 1949.²

The standards consisted of ten sediment discs showing the following milligrams of sediment: 0.0, 0.025, 0.050, 0.075, 0.10, 0.20, 0.30, 0.50, 1.00, and 2.50.

Each sediment disc was prepared in accordance with official procedures (26, 222-226). To facilitate the use and availability of these standards a composite photograph of the ten sediment discs was prepared and made a part of the standards.

FURTHER INVESTIGATIONS OF SEDIMENT STANDARDS

In 1952, C.R. Joiner, Federal Food and Drug Administration, reporting for the AOAC Committee on Sediment Tests in Milk and Cream, published in the AOAC Journal a formula for "fine" sediment to be used in preparing standard sediment pads (52). The formula was adopted by the AOAC and the technique of preparing the sample discs was published soon thereafter (27, 232-237). Photographs of sample discs prepared from both "coarse" and "fine" sediment were made available by the American Public Health Association.

In developing the "fine" mixture, Joiner pointed out that a mixture using 50 percent materials that passed the 200 sieve and 50 percent of materials passing through a 140 sieve and retained on the 200 sieve was tried, but it was found that the discs on the market were too porous and that the amount of sediment passing through the test discs exceeded the 2.8 mg. tolerance permitted. For that reason, material passing the 200 sieve was not used in the mixture. However, he stated that when less porous, but hard surfaced filtering discs were developed and marketed commercially, the tolerance for the discs should be lowered.

With the addition of a standard for "fine" sediment there also was developed a procedure for testing cotton discs for uniformity in retaining sediment (27, p. 233). The problem was reported by K.G. Weckel in 1944 (115). He pointed out the marked differences in important properties of weight, thickness, and regularity of cut, of sediment discs on the market at that time, and stated that under specific conditions of use, these irregularities could have significant effect on the retention of sediment material on the disc.

In 1952 and 1953, N.E. Watson of the Los Angeles City Health Laboratory told of his experiences in finding a suitable method of sediment testing farm bulk tank milk comparable to that for milk in cans (113, 114). Watson found that the sediment from a one-gallon sample of mixed milk was equivalent to the sediment from a one-pint sample taken off-the-bottom of a ten gallon can of milk. He devised a sediment test for farm bulk milk holding tanks by using a one-pint sample of mixed milk and concentrating the sediment from this sample on one-eighth of the filtering area of a standard 1.25 inch sediment pad.

At the Fortieth Annual Meeting of the International Association of Milk and Food Sanitarians, East Lansing, Mich., Sept. 1953, a report was given on the work of B.J. Liska and H.E. Calbert of the University of Wisconsin, on the comparison of sediment tests on mixed samples of milk with the off-the-bottom method. This study was later reported in the Journal of Milk and Food Technology (55). Their findings were in general agreement with Watson.

CONFERENCE ON SEDIMENT TESTING AND FARM FILTERING OF MILK

A conference on sediment testing and farm filtering of milk was held at Louisville, Ky., Oct. 6, 1957. The following were present for part or all of the conference: C.A. Abele, L.A. Black, Paul Corash, J.C. Flake, B.E. Horrall, Richard M. Hoyt, O.L. Hunnicutt, Curtis R. Joiner, E.E. Kihlstrum, W.C. Lawton, David Levowitz, Richard P. Marsh, R.W. Metzger, J.C. Olson, Jr., Russell R. Palmer, Don Race, A.H. Robertson, H.B. Robinson, Edward Small, Louis E. Smith, Harry F. Stone, George L. Weir, and G.W. Willits. Flake recorded the highlights of the meeting.

Representatives of Johnson and Johnson discussed an experiment among dairy farmers in a graded market of a large eastern city. The purpose of the experiment was to determine the effect of clean milk production on the quality of cheese into which the milk was manufactured.

Other points brought out by one or more individuals in the group discussion were as follows:³

"1. Dairy farms are becoming larger. Farm tanks result in more cows in the herd, but there may not be any increase in the help available or in the care given to milk quality. The time from the cow to consumption of the milk has been increasing. These factors mean that more attention should be given to the quality of milk production.

"2. Farm filtering of milk is a valuable step in production of good quality milk when the proper equipment, methods, and interpretation are used. The farmer should use the filter disc as an index of his milk production methods. The goal is to keep foreign material out of milk, but there is also merit in promptly removing any sediment that inadvertently enters the milk. The most carefully produced milk supplies contain some extraneous material. The filter disc is also of value in detection of mastitis in dairy herds.

"3. The sediment test is not an exact scientific measure of milk quality, but it is a practical, economical and effective test when it is conducted accurately and interpreted properly. Sanitarians should not read into any quality test a degree of precision for which the method is not intended. When this is done it is the fault of the individual rather than the method. Proper use and interpretation of the sediment test has a beneficial educational and psychological effect on milk producers and encourages clean milk production methods.

"4. A surprising amount of sediment has been found in some farm bulk tank milk. A practical sediment test procedure is needed for such milk. This test should be performed on mixed milk. For practical purposes one gallon of mixed milk may be considered the equivalent of the pint off-bottom test.

"5. A coarse mesh filter has been used in milk pipelines from farm bulk tanks. A considerable amount of large particle sediment has been collected on such filters.

"6. Two methods of farm tank sediment testing were discussed:

"A. The procedure of vacuum filtration by Michael H. Roman of the New York State Department of Agriculture and Markets, which involved drawing one gallon of mixed milk through a 1 1/8 inch diameter area of a lintine square.

"B. A new portable bulk milk sediment tester, developed by Johnson and Johnson which used a finger pump to force one gallon of slightly warmed milk through a 1 1/8 inch diameter area of the lintine disc. This tester is equipped with a heater designed to raise the temperature of the milk sample about 12° to 15°F. Extensive field tests have confirmed research observations regarding the necessity of warming the cold milk from bulk tanks in order to obtain consistent tests on the variety of temperatures and butterfat content encountered in the field. The tester and its operation were demonstrated to the group."

NATIONAL MEETING TO EXPLORE THE POSSIBILITY OF ESTABLISHING UNIFORM SEDIMENT STANDARDS FOR MILK

Sediment testing of milk has been a measure of quality ever since milk has been processed in commercial plants. It has been used by industry in quality improvement work, as well as by regulatory agencies as a basis for rejecting unsatisfactory milk. During the years, many attempts have been made by various individuals and regulatory agencies to standardize the methods and techniques. As a result, several different standard charts were developed by the dairy industry and State and Federal agencies. This situation, coupled with the advent of farm bulk tanks, which resulted in a change of sediment character and testing techniques, focused attention on the need for greater uniformity and wider acceptance of uniform standards. For these reasons, the National Association of State Departments of Agriculture and others, in the summer of 1961, urged the U.S. Department of Agriculture to take the leadership in developing additional standards which could be used uniformly by Federal, State, and local agencies, as well as by the dairy industry.

The AMS Dairy Division studied the situation and the problems involved and decided to undertake the project. The first step was to make arrangements to obtain representative sediment material. The sediment material for the project was furnished by four universities and one supplier of lintine discs. All of the sediment samples were prepared in accordance with official procedures (27, pp. 253-262).

In the summer of 1961, the Dairy Division obtained through its Inspection and Grading Service 20 sediment discs from farm bulk tank milk from each of 12 plants in several States. The discs showed varying degrees of sediment content representing production of cows on pasture. Also, ten additional discs were obtained from each of five plants representing milk produced during the period the cows were on dry feed.

Arrangements were also made with the Milk Marketing Orders Division, Agricultural Stabilization and Conservation Service, USDA, to obtain five sediment pads from each of two different plants in seven different areas of the country. The sediment pads were prepared from farm bulk tank milk of Grade A quality and represented a range in sediment content.

In Sept. 1961, Floyd Fenton of the Standardization Branch, Dairy Division, AMS, worked with George Fry of the Inspection and Grading Branch Laboratory in Chicago in developing over 100 standard sediment discs representing a full range of sediment content. These discs were brought back to Washington where they were compared with the sediment discs received from the field. Appropriate sediment discs were then selected representing various levels of sediment content and photographed at the USDA facilities.

A national meeting was sponsored by the Department for Feb. 20, 1962, at the South Agriculture Building, Washington, D.C.⁴ The meeting was attended by 19 technicians representing: USDA, National Association of State Departments of Agriculture, American Public Health Association, U.S. Public Health Service, Federal Food and Drug Administration, Association of Official Agricultural Chemists and various national dairy trade associations.

A few weeks prior to the meeting each person scheduled to attend was furnished with a mimeographed copy of each of the following:

1. A Summary of Sediment Testing of Milk, depicting the evolution as contained in Standard Methods for the Examination of Dairy Products.
2. A Summary of Sediment Testing of Milk, depicting its historical development.
3. State Requirements for Sediment in Manufacturing Milk.

At the opening of the meeting the Chairman, John C. Blum, Director, Dairy Division, AMS, stated the purpose of the session was to explore the possibility of establishing uniform sediment standards for milk. There was universal concern over the lack of uniformity of sediment standards.

The agenda included: (1) Type of sediment characteristics of farm bulk tank milk; (2) Levels to be included in a photographic sediment chart; (3) Method of reading--whether to the nearest disc or to the "line" (above or below a specific disc); and (4) Uniform reproduction of photographs including lamination.

Edward Small and Floyd Fenton presented the tentative sediment standards for consideration by the group. It was pointed out that the photographic sediment standards for discussion related primarily to the raw milk supply and that the lower levels on the USDA and APHA charts then in use could be applied to bottled milk. It was noted that these standards were not applicable, for example, to scorched particles of dry milks. USDA had developed, in 1951, photographic scorched particle standards.

Several States as well as a number of Health Departments and some in the industry used the standard off-the-bottom grading chart for classifying the sediment from farm holding tank milk. Others used the "fine sediment" portion of the APHA chart and still others used the photographic standard published jointly by ABI, ADMI, EMA, and NCI. The latter chart was a modified photograph of certain discs shown in the "fine sediment" portion of the APHA chart.

An exhibit was presented by USDA showing the different photographic standards then in use by various State regulatory agencies and by industry. Another exhibit displayed sediment discs prepared from bulk tank milk (Grade A and manufacturing), from individual producers from different areas of the country and from pasture and winter milk. A third exhibit prepared by USDA included a group of seven photographs of three sediment discs each. These discs were prepared according to Standard Methods for the Examination of Dairy Products for three levels of sediment content, 0.0625 mg., 0.125 mg., and 0.3125 mg. of sediment shown on a 0.40 inch filtering area. These levels were equivalent to 0.5, 1.0, and 2.5 mgs. of sediment, respectively, on a 1 1/8 inch filtering area. The seven photographs represented the following classes of sediment:

- (1) Coarse (100%)
- (2) Fine (100%)
- (3) Extra Fine (100%) - through 200 mesh
- (4) Fine 50%, extra fine 50%
- (5) Fine 80%, coarse 20%
- (6) Extra Fine 60%, fine 30%, coarse 10%
- (7) Extra Fine 50%, fine 40%, coarse 10%

It was generally agreed that fine and extra fine sediment predominated in bulk tank milk. It was determined that the problem of sediment had not disappeared with the coming of bulk tank milk, but that different standards were needed than those used for can milk. After considerable discussion, it was suggested that the USDA photographs be field tested to determine which chart was most representative of the type of sediment found in farm-holding tank milk.

In regard to the levels of sediment, it was pointed out that 27 States had sediment requirements for manufacturing milk, 18 of which used 2.5 mg. as the cut-off level for acceptable milk in cans. Thirteen of these specifically designated the number of milligrams, while five appeared to use that figure from a visual comparison of discs. Three States had a cut-off of 3.0 mg., one had 2.0 mg., and one at 1.0 mg. Four States were not specific as to the dividing line between "acceptable" and "reject" milk. Only six States had specific sediment requirements for bulk tank milk. Four of these cut off at the equivalent of 2.5 mg., one at 2.0 mg., and one at 1.0 mg.

It was generally agreed that 2.5 mg. was a practical cut-off level, consistent with established practice as a beginning level for uniform national standards. Considerable attention was given to the allowable

amount of sediment for the second disc, which is used in classifying milk as "probational," i.e., requiring corrective field service by the receiving plant. USDA indicated a willingness to consider modifying the second disc from 1.0 to 1.5 mg. so that the level requiring corrective field service would be on a comparable basis with that of industry practice. USDA stated categorically it would not be amenable to increasing the sediment allowance from 1.0 to 1.5 mg. and then read to the mid-point between 1.5 and 2.5 mg. Everyone present acknowledged they were not seeking more lenient standards, that is, beyond 1.5 mg.

There was considerable discussion of the relative merits of reading to the nearest disc or to the "line" in evaluating sediment discs. It was noted that industry practice generally had been to read to the nearest disc. Several persons indicated that it was difficult to use an imaginary line in reading between two discs as a dividing line and that it was easier to read to a specific disc.

The fourth area of discussion centered around the problem of photographing the discs and obtaining uniformity in successive printings. It was generally agreed that if uniformity could be attained through the use of one chart using the same method of reading it would be a great step forward and that any national chart to obtain official status and acceptance needed to be coordinated with APHA and AOAC.

It was suggested that charts should be laminated in plastic to make them more permanent. However, it was pointed out that some degree of sharpness was lost by lamination and that the laminated charts tended to turn yellow with age, with further loss of clarity. The cost also was greatly increased by lamination.

It was generally agreed that progress was made toward a better understanding of the problems through this exchange of ideas and suggestions. The group recommended that the exploration be continued through additional work on the problems discussed and urged that another meeting be held at an appropriate time. They also urged USDA to prepare additional photographs of six of the seven sample charts displayed and asked that the new photographs be mailed to those who wished to compare them with discs at different plants, in an attempt to choose the one most representative as to the character of sediment.

The individuals attending the February 20 meeting were:

L.A. Black, Cincinnati, Ohio	USPHS
John C. Blum, Washington, D.C.	USDA
Jim L. Dizikes, Chicago, Ill.	USDA
Floyd E. Fenton, Washington, D.C.	USDA
John C. Flake, Chicago, Ill.	APHA and EMA
*N.L. Franklin, Richmond, Va.	Virginia Dept. of Agriculture
Kenton L. Harris, Washington, D.C.	AOAC and FDA
L.S. Houser, Washington, D.C.	USPHA
Richard M. Hoyt, Washington, D.C.	Nat'l Milk Producers Federation

John H. Lloyd, Jr., Washington, D.C.	Milk Industry Foundation
Richard Meyer, Washington, D.C.	FDA
R.M. Parry, Hartford, Conn.	IAMFS
Rafael Pedraja, Chicago, Ill.	ADMI
C.W. Pegram, Raleigh, N.C.	NASDA (Dairy Division)
Brace Rowley, Topeka, Kans.	NASDA (Dairy Division)
Edward Small, Washington, D.C.	USDA
John F. Speer, Jr., Washington, D.C.	IAICM
R.P. Zelm, Chicago, Ill.	ADMI

*Guest of Pegram

Mimeographed minutes of the meeting were mailed to each person in attendance.

Following the 1962 meeting, USDA developed new sets of photographic sediment charts based on the following:

Mixed Sample (Fine)
(0.40 inch diam. disc)

Small
1. - 0.0625 mg.
2. - 0.1875 mg.
3. - 0.3125 mg.

Off-the-bottom Sample (Coarse)
(1 1/8 inch diam. disc)

Small
1. - 0.50 mg.
2. - 1.50 mg.
3. - 2.50 mg.

Large
1. - 0.025 mg.
2. - 0.0625 mg.
3. - 0.1875 mg.
4. - 0.3125 mg.
5. - 0.3750 mg.
6. - 0.7500 mg.

Large
1. - 0.20 mg.
2. - 0.50 mg.
3. - 1.50 mg.
4. - 2.50 mg.
5. - 3.00 mg.
6. - 6.00 mg.

At each level, the discs for the 0.40 inch filtering area are equivalent to the same quantities on the 1 1/8 inch filtering area discs.

SECOND NATIONAL MEETING CALLED TO ESTABLISH UNIFORM SEDIMENT STANDARDS FOR MILK

A second sediment standards meeting, attended by 25 representatives of Federal and State agencies and various segments of the dairy industry, was held in the South Agriculture Building, May 23, 1963, to consider further the development of uniform sediment standards for milk.⁵ The meeting was sponsored by the Standardization Branch, Dairy Division, AMS, and was a follow-up of the one held Feb. 20, 1962.

Since a number of those attending were not present at the 1962 meeting, the general objective was restated; i.e., the development and issuance of uniform photographic sediment standards for milk, for use by USDA, APHA, and FDA and the dairy industry.

At the beginning of the meeting Elmer S. Kihlstrum of the Johnson and Johnson Company, through the cooperation of the Dairy Industries Supply Association, demonstrated several sampling devices (aspirator, gun, and vacuum types) used in conducting sediment tests of farm-holding tank milk and discussed sampling methods. Kihlstrum then presented the results of a sediment survey conducted by Johnson and Johnson during the first quarter of 1963, involving over 6,000 sediment tests in 20 States. The study indicated that milk produced with the most efficient mechanical equipment available was not as clean as when individual attention was given to the milking operation and milk filters were used as a check. Also it showed that elimination of the ten-gallon can and provisions for prompt cooling to below 40°F. constitute only a part of the job of obtaining good quality milk.

Joseph Burns, Chairman of the Filters Market Action Committee of the Dairy Industries Supply Association, reported on a survey of sediment testing made by that committee. Questionnaires had been sent to several hundred sanitarians (State and local), large dairies, cooperatives, and laboratories to determine the amount of sediment testing being done. Almost half of them replied and the results indicated considerable lack of uniformity in the State, city, and industry programs. However, many persons indicated their intention to increase activity in this area.

The sediment charts which USDA developed after the 1962 meeting were reviewed. There was a discussion as to whether the discs should be identified by numbers alone, or whether the milligrams of sediment also should be shown on each disc. It was agreed to prepare separate charts for each group of discs and to number the three discs on the small charts of the 0.40 inch filtering areas as 1, 2, 3 and also show the milligrams directly under the number, with the figures reported as "milligrams equivalent" to the 1 1/8 inch filtering area. The same procedure would be followed for the 6 disc charts except that 0.0 mg. would be substituted for the 0.20 mg. and the discs numbered 0 to 5, respectively. The discs numbered 1, 2, 3 on the large chart would correspond to the same numbers on the small chart. For greater uniformity the photographs of the three discs on the smaller chart were to be prepared from the negatives of the same discs on the larger chart.

The matter of different methods used by industry in reading to the nearest disc as compared to the procedure advocated by USDA in reading to the "line" was thoroughly discussed. USDA representatives again advised that their willingness to increase the sediment allowance on the No. 2 disc from 1.0 to 1.50 mg. was contingent upon reading to the "line." It was agreed that when the charts developed by USDA were used, the sediment pads were to be read to the "line." However, in the meantime, the industry charts (0.0 mg., 0.50 mg., and 2.50 mgs.) were to be read to the nearest disc since they were developed on that premise.

The question of obtaining agency endorsement and the names to appear on the charts was discussed. USDA proposed that the charts read:

United States Department of Agriculture
Sediment Standards for Milk and Milk Products
Prepared in cooperation with U.S. Food and Drug
Administration and the American Public Health
Association

This proposal received approval from all agencies involved.

The importance of examining each print before acceptance was emphasized and FDA requested joint participation with USDA in selecting the master prints to be used in checking all other prints. FDA also suggested joint screening participation on the first one hundred prints to help standardize the selection. Each agency was to obtain charts from USDA as needed.

Those attending the May 23, 1963, meeting and representation were:

L.A. Black, Cincinnati, Ohio	USPHS
Joseph Burns, Washington, D.C.	DISA
John C. Blum, Washington, D.C.	USDA
Floyd E. Fenton, Washington, D.C.	USDA
John C. Flake, Chicago, Ill.	APHA and EMA
Edwin W. Gaumnitz, Chicago, Ill.	ABI and NCI
Kenton L. Harris, Washington, D.C.	AOAC and FDA
L.S. Houser, Washington, D.C.	USPHS
Richard M. Hoyt, Washington, D.C.	Nat'l Milk Producers Federation
M.W. Jefferson, Richmond, Va.	NASDA (Dairy Division)
C.R. Joiner, Atlanta, Ga.	AOAC and FDA
Elmer E. Kihlstrom, Washington, D.C.	DISA
Clyde D. Lacey, Oklahoma City, Okla.	NASDA (Dairy Division)
John H. Lloyd, Jr., Washington, D.C.	Milk Industry Foundation
Eugene T. McGarrahan, Washington, D.C.	USDA
Harold E. Meister, Washington, D.C.	USDA
Richard Meyer, Washington, D.C.	FDA
R.M. Parry, Hartford, Conn.	IAMFS
Rafael Pedraja, Chicago, Ill.	ADMI
Edward Small, Washington, D.C.	USDA
John F. Speer, Jr., Washington, D.C.	IAICM
Irving Schlaffman, Washington, D.C.	USPHS
Harold Steinke, New York, N.Y.	NCI

Two industry representatives, Reid and Ellsworth, also participated in the discussions.

The National Association of State Departments of Agriculture at their Annual Meeting held in Winston-Salem, N.C., Sept. 22-26, 1963, passed a resolution commending the U.S. Department of Agriculture for taking the leadership in developing sediment standards suitable for national adoption and usage.

In Nov. 1963, Fenton worked with Joiner at the Food and Drug Administration laboratory at Atlanta, Ga., on the sediment standards. They ran a complete set of the small discs prepared from Joiner's sediment material and found them to check out very well with the discs previously prepared and with the photographs of these discs.

USDA ISSUES ADDITIONS TO U.S. SEDIMENT STANDARDS FOR MILK

Additions to the U.S. Sediment Standards for Milk and Milk Products were prepared and published in the Federal Register, Feb. 29, 1964, under proposed rule making.⁶ The standards were shortly thereafter prepared in final form and published in the Federal Register, May 6, 1964, effective immediately.⁷ This was the culmination of a two year effort with industry groups, State agencies, the American Public Health Association, the U.S. Public Health Service, and the Federal Food and Drug Administration.

The standards were formulated to encompass coarse and fine sediment. The following standards based on coarse sediment were established:

0 - 0.0 mg.	3 - 2.5 mg.
1 - 0.5 mg.	4 - 3.0 mg.
2 - 1.5 mg.	5 - 6.0 mg.

To facilitate the use and availability of these standards, a composite photograph of the six sediment discs was prepared. Each sediment disc was prepared from "coarse" sediment in accordance with official procedures (28, pp. 259-260).

The standards most commonly used by the industry for the examination of raw milk by the "off-the-bottom" method were the same as the three sediment discs numbered 1, 2, and 3, showing 0.5, 1.5, and 2.5 mg. of sediment respectively.

Standards also included six sediment discs each of which is numbered 0 to 5 representing one of the following amounts of sediment on a 0.40 inch diameter filtering area, equivalent to the respective amounts of sediment on the 1 1/8 inch diameter filtering area:

0 - 0.0 mg.	(0.0 mg. equivalent)
1 - 0.0635 mg.	(0.5 mg. equivalent)
2 - 0.1875 mg.	(1.5 mgs. equivalent)
3 - 0.3125 mg.	(2.5 mgs. equivalent)
4 - 0.3750 mg.	(3.0 mgs. equivalent)
5 - 0.7500 mg.	(6.0 mgs. equivalent)

Each sediment disc was prepared from "fine" sediment in accordance with official procedures (28, pp. 257-259). In addition, the standards also included those most commonly used for the examination of raw milk by the "stirred sample" method and are the same three sediment discs numbered 1, 2, and 3 showing 0.0625 mg., 0.1875 mg., and 0.3125 mg. of sediment respectively.

During the past few years, the dairy industry has increasingly used the "universal" sample system to determine the quality and composition of producer milk. Under this system a small sample of 1, 2, or 4 ounces is taken of the producer's milk each time it is collected from the farm for use in testing for quality and composition.

The committee on the chapter "Sediment in Fluid Milk," of Standard Methods for the Examination of Dairy Products, on which the Department is represented, responded to the need for sediment test procedures utilizing small sizes by designing and conducting a collaborative study to determine the feasibility of using "universal" samples to measure sediment content. The results of the study were officially published (117).

The Standardization Branch, Dairy Division, AMS, on the basis of their own testing and the results of the collaborative study, proposed an amendment to the U.S. Sediment Standards for Milk and Milk Products which would be applicable to universal sample sizes (4 ounces, 2 ounces, and 1 ounce) that are being utilized by the industry in their milk quality programs. The sediment standard for the universal sample eliminates the need of larger special samples for determining sediment in milk. The proposed standard is equivalent to those regularly used for the one-pint mixed sample. Each sediment disc is prepared from "fine" sediment in accordance with official procedures (28, pp. 195-199).

The proposed amendment was published in the Federal Register, May 26, 1977, under proposed rule making and all interested persons were given an opportunity to submit data, comments and recommendations, no later than July 15, 1977.⁸

The proposed standards consisted of three series of four sediment discs numbered 0 to 3 representing one of the following amounts of sediment on a 0.10 inch, 0.14 inch, and 0.20 inch filtering area and is equivalent to the respective amounts of sediment of the 1 1/8 inch diameter filtering area as shown below:

0.10 inch diameter filtering area

- 0 - 0.0 mg. (0.0 mg. equivalent)
- 1 - 0.0039 mg. (0.50 mg. equivalent)
- 2 - 0.0118 mg. (1.50 mg. equivalent)
- 3 - 0.0196 mg. (2.50 mg. equivalent)

0.14 inch diameter filtering area

- 0 - 0.0 mg. (0.0 mg. equivalent)
- 1 - 0.0078 mg. (0.50 mg. equivalent)
- 2 - 0.0235 mg. (1.50 mg. equivalent)
- 3 - 0.0391 mg. (2.50 mg. equivalent)

0.20 inch diameter filtering area

- 0 - 0.0 mg. (0.0 mg. equivalent)
- 1 - 0.0156 mg. (0.50 mg. equivalent)
- 2 - 0.0469 mg. (1.50 mg. equivalent)
- 3 - 0.0781 mg. (2.50 mg. equivalent)

To facilitate the use and availability of these standards a composite visual aid of the three series of four sediment discs has been prepared.

The members of the committee on the chapter "Sediment in Fluid Milk," Standard Methods for the Examination of Dairy Products, are:

William L. Arledge - Dairymen, Inc.

Warren S. Clark, Jr. - American Dry Milk Institute

Michael H. Roman - New York State Department of Agriculture

Richard W. Webber - Dairy Standardization Branch, Poultry and Dairy Quality Division, USDA

Earl O. Wright - International Association of Milk, Food and Environmental Sanitarians

The comments received on the proposed sediment standards were generally favorable. Consequently, the sediment standards were amended as proposed and published in the Federal Register, Aug. 19, 1977, effective Sept. 1, 1977.⁹ The amended sediment standards were prepared by Richard Webber.

¹ 14 F.R. 3284

² 14 F.R. 6658

³ J.C. Flake, Evaporated Milk Association. Notes taken as Secretary of the Conference, Oct. 31, 1957. Available in Poultry and Dairy Quality Division, FSQS, USDA.

⁴ Edward Small and Floyd Fenton. Minutes of meeting, Feb. 20, 1962. Available in Poultry and Dairy Quality Division, FSQS, USDA.

⁵ Edward Small and Floyd Fenton. Minutes of meeting, May 23, 1963. Available in Poultry and Dairy Quality Division, FSQS, USDA.

⁶ 29 F.R. 2891

⁷ 29 F.R. 5881

⁸ 42 F.R. 27011

⁹ 43 F.R. 41846

MANUFACTURING GRADE MILK STANDARDS

Historically the U.S. milk supply developed into two segments--milk for fluid use, designated as "Grade A," and the other portion, designated as "manufacturing grade." Manufacturing grade milk is used for the manufacture of butter, cheese, dry milks, evaporated and condensed milk, and other dairy products. Considerable quantities of Grade A surplus milk also are used for the manufacture of dairy products. For many years, the amount of manufacturing grade milk represented about one-half of the total milk production, but during the past quarter century the production of manufacturing grade milk has been shrinking and at the present time has reached the level of about one-fifth of the total milk production.

In October 1948, a preliminary draft of Tentative U.S. Standards for Grades of Milk for Use in the Manufacture of Dairy Products was formulated for discussion purposes by C.J. Babcock, Manufactured Dairy Products Division, Dairy Branch, PMA.

The nomenclature of the tentative standards covered four grades: U.S. No. 1, U.S. No. 2, U.S. Undergrade, and No Grade. The grade of milk was to be determined on the basis of five quality factors: flavor, physical appearance, acidity, sediment and bacterial content.

The draft was sent to the American Butter Institute, National Cheese Institute, American Dry Milk Institute, Evaporated Milk Association, and the International Association of Ice Cream Manufacturers for review by quality committees. Copies were also sent to the dairy departments of the State colleges, the State Departments of Agriculture, and to the Office of the Surgeon General, Department of the Army, for comments and suggestions.

Unfortunately, the purpose or objective of the proposed standards was not set forth and there was considerable confusion as to intent. Members of industry and others felt it was not clear whether the proposal was intended as a grading service, the use of which might be optional, or whether it was expected or intended for the standards to become compulsory in their application.

The standards, of course, were to be used mainly in improving the quality of milk and milk products, on a voluntary basis. The most prevalent criticism received was that the standards, especially the bacterial estimates, were too lenient. The second most prevalent criticism dealt with "Nomenclature of the Grades." This was followed by criticism of the "acidity" factor. Other suggestions received included: setting a temperature standard, requiring farm inspection, and keeping a record of quality tests.

In Sept. 1949, C.J. Babcock and D.R. Strobel revised the preliminary draft of the tentative standards for manufacturing grade milk. The nomenclature of the grades was changed to U.S. No. 1, U.S. No. 2, U.S. No. 3, and No Grade. The sediment content was to be determined on the basis of the USDA Sediment Standards for Milk and Milk Products, promulgated in 1949. The specifications for each grade were:

- U.S. No. 1 - 0.30 mg. or less (includes milk with a sediment content nearer 0.30 mg. than 0.50 mg.)
U.S. No. 2 - 0.50 mg. (includes milk with a sediment content nearer 0.50 mg. than 0.30 mg. or 2.50 mg.)
U.S. No. 3 - 2.50 mg. (includes milk with a sediment content nearer 2.50 mg. than 0.50 mg. but not more than 2.50 mg.)
No Grade - More than 2.50 mg.

On the basis of comments and suggestions received from industry, colleges, and state departments of agriculture, C.J. Babcock and D.R. Strobel revised the Sept. 1949 draft of the standards. The standards were published in the Federal Register, Aug. 17, 1950, under proposed rule making.¹ Three extensions of time were granted for interested persons to submit their views and arguments. The last extension published in the Federal Register, Dec. 15, 1950, permitted comments and suggestions until June 30, 1951.² Because of insufficient support, no further action was taken on the proposed standards.

RENEWED INTEREST IN QUALITY IMPROVEMENT

During the mid and late 1950's some producer groups, industry leaders, college and regulatory officials recognized the need for quality improvement in manufacturing milk. While significant progress in improving milk quality was being accomplished in some quarters, the situation left much to be desired in others.

The AMS Dairy Division plant survey work, which had been conducted over a period of many years, further revealed the need for quality standards for milk for manufacturing. These surveys had shown an extremely wide range in milk quality received at manufacturing plants and somewhat comparable gradations of plant operations in many sections of the country.

A study of State requirements for milk for manufacturing showed that generally little attention had been given to the development of meaningful standards for such milk. Many States attempted to control the quality of milk for manufacturing through sediment content requirements only. In general the State requirements were fragmentary and diverse. Undoubtedly, the absence of adequate quality standards had impeded progress in quality improvement. The manufacturing branches of the dairy industry were fully aware of the problem and the attendant deficiencies.

REQUESTS AND DEVELOPMENT OF STANDARDS

The development of more uniform quality standards for manufacturing milk had been a subject of industry discussion for a number of years. John C. Flake, Evaporated Milk Association, and Edward Small worked together on the International Association of Milk and Food Sanitarians (IAMFS) Committee on Ordinances and Regulations for three years. During most of the time, the principal project related to the establishment of quality standards by IAMFS for State adoption on a voluntary basis.

During the 1957 series of conferences on grade standards for nonfat dry milk, members of the industry had suggested the desirability of a uniform approach to standards for milk going into all manufactured dairy products. Since that time, a number of industry groups had urged USDA to draft uniform quality standards for milk for manufacturing and specifications for dairy plant operations. They contended that such an approach would be more equitable since there were no known objective tests comparable to the DMC test reflecting both the case history of the raw milk and the hygiene of manufacture for butter, Cheddar cheese, evaporated milk, and other manufactured dairy products.

In the fall of 1958, following several such requests, the AMS Dairy Division received approval from the Assistant Secretary of Agriculture to activate a working group of industry technicians to assist in the formulation of such standards.³

At the 1958 annual meeting of IAMFS, the Committee announced its withdrawal from the project, stating that the work USDA was about to embark upon could lead to a satisfactory fulfillment of the recommendations contained in the 1956 Committee Report with respect to milk for manufacturing.

Since USDA's Agricultural Research Service (ARS) was also concerned with milk production, the AMS Dairy Division arranged a meeting with representatives of ARS to explain the interest in the development of a manufacturing milk code.⁴ The ARS representatives said ARS would lend assistance on an advisory basis.

The work was undertaken under authority of the Agricultural Marketing Act of 1946, which authorizes and directs the Secretary of Agriculture to:

develop and improve standards of quality... and
recommend and demonstrate such standards in order
to encourage uniformity and consistency in commercial
practices.⁵

The first working draft of the standards was prepared in early 1959 by Edward Small and Floyd Fenton, assisted by Bennett Ommodt and Harold Meister. Eight national trade associations each designated two technicians and two alternates to work with the Dairy Division. These technicians represented all segments of the industry and all parts of the country. The members of the working group were selected on the basis of their broad and practical experience in milk production methods and practices and plant operations.

Herbert L. Forest chaired the first working session with the sixteen technicians in Chicago, Mar. 18 and 19, 1959.⁶ Small presented the draft standards, which were thoroughly discussed by the working and advisory group. While most of the technicians agreed on the primary objective of the program, there was a divergence of opinion on a number of items, particularly the bacterial standards for raw milk, the requirements relating to farm certification, and the transfer of records.

Differences were inevitable and no doubt had a salutary effect. Nevertheless, practically every item in the quality standards and specifications received the support and approval of a number of the members of the working group. There was some fear on the part of at least one trade association that the proposal of USDA would place in jeopardy the attaining of any further progress of industry self-administered improvement programs. USDA felt that industry groups could carry out compatible industry programs for quality improvement within the general framework of the proposed standards.

A second working session was held in Chicago in May 1959, with the technicians or advisory group.⁷ A revised draft of the standards was thoroughly reviewed and discussed.

Working sessions also were held with a committee of the Dairy Division of the National Association of State Departments of Agriculture (NASDA). One such meeting was held in St. Louis, Mo., Oct. 25, and 26, 1961. The two-day session was chaired by J. Phil Campbell, Commissioner of Agriculture of Georgia. The Dairy Division was represented by John C. Blum, Small and Meister.

J. Phil Campbell opened the meeting by reading the following resolution:

That the National Association of State Departments of Agriculture in convention assembled at Hershey, Pennsylvania, Oct. 1-5, 1961, endorsed the principle of national standards for manufacturing milk to be established by a joint committee representing the National Association of Dairy Divisions and the United States Department of Agriculture. The Association urges that the standards as now proposed by the USDA be condensed, revised, simplified and submitted to the individual States for recommendations before publication.⁸

Up to this point, the manufacturing milk standards had been prepared and presented in two separate documents, one relating to production requirements and the other to processing operations. As a result of the Hershey Resolution, the proposed manufacturing milk standards were completely overhauled. They were simplified into one document.

In the spring of 1962, various groups requested the Dairy Division to explain the newly proposed standards and specifications. Meetings were held in April with industry and college representatives and members of regulatory agencies at Louisville, Ky., Oklahoma City, Okla., Fayetteville, Ark., and Topeka, Kans.⁹ In addition, the American Farm Bureau requested an explanatory meeting with its dairy committee in Chicago. The meetings were chaired by Harold Meister and the proposed standards were presented by Edward Small, followed by a question and answer period to enable a free exchange of ideas and views.

During the period 1959 to 1962, Herbert Forest, John Blum and Edward Small were invited to speak at several dairy industry conventions and meetings to further acquaint the dairy industry with the national program the Dairy

Division recommended for adoption by State regulatory agencies.^{10,11} These opportunities were very helpful in clarifying some of the misunderstandings held by various individuals and groups.

Another working session was held with a committee of the Dairy Division, NASDA, in Chicago, Oct. 12, 1962.¹² The session was chaired by Joseph N. Gill, Commissioner of Agriculture of Connecticut. The Dairy Division was represented by Blum, Small, and Meister. The purpose of the meeting was to consider the modifications of certain provisions of the proposed quality standards and specifications for manufacturing grade milk and plant operations.

A small group of technicians designated by the American Dairy Science Association also furnished advice and guidance in the formulation of the initial drafts of the proposed quality standards and specifications.

After consideration of all comments and suggestions of the last working draft of the proposed standards the Dairy Division published in the June 26, 1963, Federal Register a set of recommended minimum quality standards and specifications for manufacturing grade milk.¹³ The standards were the end product of four years of extensive study and work with industry technicians, state regulatory officials, college workers, farm organizations, and others. The standards were designed to encourage the production of higher quality manufacturing grade milk and to assure the efficient and sanitary manufacture of better, more dependable quality dairy products.

The standards were designed to apply to milk produced for processing and manufacturing into products for human consumption but would not apply to Grade A or comparable requirements (72, p. 82). Grade A surplus milk shipped to a dairy manufacturing plant would be examined at the plant for physical appearance, odor, sediment and bacterial content to determine compliance with the manufacturing milk standards. The farm and raw milk requirements applied to milk going to dairy plants as well as to other food processing outlets. The minimum specifications for plants applied only to those plants that manufactured dairy products, such as butter, cheese, dry whole milk, nonfat dry milk, dry buttermilk, dry whey, evaporated milk, and ice cream mix.

The standards provided for a delay of up to five years, where necessary, in the requirement of a milk house (or milk room) where milk was handled in cans, or the cooling of milk in cans to 60 degrees F. or lower. When farm bulk tanks were used, however, they were to be installed properly in a milk house or milk room, when the standards were implemented.

Administration of the program, once adopted by a State, rested entirely with the State. The major broad provisions of the standards related to (1) farm inspection and certification, (2) quality requirements of the raw milk supply, and (3) plant requirements and licensing. Once the standards have been adopted by a State, all farms producing manufacturing grade milk would have to be inspected and certified within 24 months and again each year after the initial certification. Primary responsibility for certifying a farm rested with the plant fieldman.

This is how farm certification would work: If the farm qualified on the first inspection, a "farm certification report" would be issued. Should the inspection reveal noncompliance, a second inspection by the fieldman would be required within 30 days after the initial inspection. If the farm failed to qualify on the second inspection, then the fieldman would notify the regulatory agency, and an official inspector would visit the farm within 30 days. If the inspector determined that the farm still did not comply, the producer's authorization to sell milk for human food would be withheld until the farm qualified for certification. If the fieldman or inspector determined that corrections on the farm would require some capital investments, a reasonable extension of time would be granted by the regulatory agency. Suspension, revocation, or reinstatement of a farm would be made only by State-employed inspectors.

Specifically, the elements and basic requirements of farm certification involved: (1) health of the herd, (2) milking facilities and housing, (3) milking procedure, (4) design, construction, and sanitation of the utensils and equipment, and (5) water supply.

All animals in the herd must be maintained in a healthy condition and be properly fed and kept. The herd must be located in an area where less than 0.5 percent of the cattle are infected with tuberculosis. A herd not located in such an area must be tested annually and all additions to the herd must be from an area or from herds meeting these same requirements. Also the herd must be in an area where not more than 1 percent of the cattle and 5 percent of the herds are infected with brucellosis. If the herd is not in a modified-certified brucellosis-free area, it must be blood tested annually or milk-ring-tested semi-annually. All additions to the herd must be from an area or from herds meeting these same requirements.

Milk from cows treated for mastitis by infusion of the udder must be excluded from the milk supply for at least 72 hours after the last treatment, unless otherwise stated on the label of the antibiotic container. Drugs administered by injection into the blood stream or muscular tissue that leave a residue in the milk longer than 96 hours after injection must not be used.

Other requirements under the program related to providing a milking barn or milking parlor of adequate size and arrangement to permit normal sanitary milking operations. It must be well lighted and ventilated, and the floors and gutters in the milking area must be constructed of concrete or other impervious material. The facility must be kept clean, the manure removed daily, and no swine, fowl, or other animals were to be permitted in any part of the milking area. The yard or loafing area must provide ample space to prevent overcrowding and be graded and drained to prevent pools of water or organic waste accumulations.

Udders and flanks of all milking cows must be clipped of long hair. Immediately before milking, udders and teats must be washed or wiped with a clean damp cloth or paper towel moistened with a sanitary solution and wiped dry, or a comparable sanitary method may be used.

A milk house or milk room must be provided. When milk is handled in cans, this provision may be delayed for a 5-year period. If it is a part of the barn or other building, the milk house or milk room must be partitioned, ceiled and screened to prevent the entrance of dust, flies, or other contamination. A milking parlor used strictly as a milking facility in combination with a milk house - when properly equipped, arranged and maintained - need not be partitioned.

A well-drained concrete floor must be provided, and the walls and ceilings must be constructed of smooth, easily cleaned material. All outside doors must open outward and be self-closing unless they are provided with tight-fitting screen doors that open outward or unless other effective means are provided to prevent the entrance of flies.

If a farm bulk tank is used, it must be properly located in the milk house to permit access to all areas of cleaning and servicing. A small platform or slab constructed of concrete must be provided outside the milk house, properly centered under a suitable port opening. The opening must be fitted with a tight self-closing door. And the truck approach to the milk house must be properly graded and surfaced to prevent mud or pooling of water at the point of loading.

Milk in cans must be cooled immediately after milking to 60 degrees or lower unless it is delivered to the plant within two hours after milking. This provision also may be delayed for a 5-year period.

All milking equipment and utensils must be maintained in good condition, free from rust, open seams, milkstone, or any unsanitary condition. They must be washed, rinsed, and drained after each milking, and they must be stored in suitable facilities and sanitized immediately before use.

The dairy farm water supply must be safe, clean, and ample for cleaning dairy equipment and utensils.

Each farm is rated in terms of specific factors based on a farm score card, designed so that marked failure in any one area would prevent farm certification.

The second aspect of the recommended program, quality requirements of the raw milk supply, deals with platform inspection of the raw milk. Milk delivered to plants must comply with certain quality specifications as to odor, physical appearance, bacteria, and sediment content. Testing for bacteria and sediment content must be conducted at least once each month, and a routine sight and odor examination must be made of each shipment of milk received at the plant or receiving station. To be acceptable, the milk must be fresh and sweet. It must not show any abnormal condition (such as curdled, ropy, bloody, or mastitic condition), as indicated by sight or odor.

Three classifications for bacterial content are established:

Milk is classified as No. 1 if it does not decolorize in less than 4 1/2 hours when the methylene blue test is used, or in not less than 2 1/2 hours

if the resazurin reduction test is used, or does not exceed 500,000 per milliliter when examined by the direct microscopic clump count or standard plate count test.

Milk is classified as No. 2 if it does not decolorize in less than 2 1/2 hours or 1 1/2 hours, using the methylene blue or resazurin test, respectively, or if it does not exceed 3 million per milliliter when applying the DMC or SPC tests.

Milk which decolorizes in less than 2 1/2 hours or 1 1/2 hours, MB or resazurin test, respectively, or exceeds 3 million per milliliter, based on DMC or SPC test is classified as "Undergrade" and may be accepted for a period not exceeding 4 weeks.

Milk containing a sediment content of more than 2.5 milligrams, based on the off-the-bottom testing of a pint sample, is classified as "reject" and milk containing over 1.5 milligrams but not over 2.5 milligrams as "probational". Probational milk may be accepted for a period of not more than 10 days. The standards also provided for a sediment content classification for farm bulk tank milk, on a mixed sample basis, equivalent to unstirred milk in cans.

If a producer has not met the bacteria and sediment requirements, the fieldman visits his farm within seven days from the date of the second consecutive substandard test. The visit is made to correct any deficiencies in the producer's facilities or milk handling practices. Milk graders and bulk milk collectors (haulers) must be qualified and trained in the grading of raw milk and licensed by the regulatory agency.

Plant licensing, the third aspect of the program, requires compliance with essential elements relating to: (1) premises, buildings and facilities, (2) equipment and utensils, and (3) plant operations. Included are such checks as maintenance of buildings, sanitation, pasteurization, laboratory control, water supply, employee cleanliness and health, waste disposal, transportation of raw milk, cooling, storage and packaging of the finished products.

All plants are to be inspected by the State agency administering the standards. Plants must qualify for licensing within 12 months following the effective date of the standards. Each dairy plant is rated in terms of specific factors based on an appropriate plant survey form. The plant inspection report form is designed so that extremely unsatisfactory conditions in any one facet of the operations would prevent the issuance of a license.

The recommended standards provide the basis for substantial progress toward assuring higher quality, more dependable and safe dairy products for the American public.

The approach to quality improvement is three dimensional: (1) a realistic set of standards--not too stringent, yet at the same time one that will upgrade the general quality of milk; (2) adequate and effective enforcement coupled with a service and educational program; and (3) industry cooperation--unless industry actively supports the program, the best set of standards and enforcement will fall short of the desired goal.

It was recognized that some States did not have legislative authority to adopt the USDA minimum standards; therefore, a sample State Enabling Act to facilitate the enactment of the recommended requirements was included.

The development of these standards and specifications was controversial from the very outset. The dairy industry considered some of the requirements unrealistically severe. A factor in the viewpoint of those opposing the formulation of these manufacturing milk standards was the apprehension that application might go beyond voluntary adoption by States and filter through to becoming the criteria for Government purchases, such as the Commodity Credit Corporation and the military. Other objections to these manufacturing milk standards were based on the possibility of overlap of responsibility between the Public Health Service and the Department of Agriculture. The House Committee on Government Operations, studying consumer protection activities at all jurisdictional levels, had raised questions as to where the line was drawn between the U.S. Public Health Service codes for fluid milk and frozen desserts and the new USDA minimum standards, all of which were intended for voluntary adoption.

The language used in the USDA minimum standards for defining milk for manufacturing purposes attempted to delineate these jurisdictional areas. The definition reads: "Milk produced for processing and manufacturing into products for human consumption, but not subject to Grade A or comparable requirements." The intended inference was that USPHS is the arbiter of Grade A products and USDA all the rest. The USDA standards neither specifically included or excluded ice cream from the definition of dairy products. USDA defined dairy products as: "Butter, cheese (natural or process), dry whole milk, nonfat dry milk, dry buttermilk, dry whey, evaporated milk (whole or skim), condensed whole milk and condensed skim milk (plain or sweetened), and such other products, for human consumption, as the regulatory agency may designate."

In 1967, the Department of Health, Education and Welfare developed an interest in manufacturing milk standards which brought about a conflict or overlapping of responsibilities in this area. In Jan. 1968, a Memorandum of Understanding was prepared whereby USDA and HEW reached a policy agreement to serve as a basis for the development of consistent regulations and recommendations for standards and ordinances covering instant nonfat dry milk and for related purposes. The dairy technicians of HEW and USDA held several working sessions in 1968 and 1969 on the development of a proposed revision of the 1963 USDA standards for manufacturing milk. The question finally arose as to which department should issue the standards, whether USDA or HEW, or whether there should be joint issuance. In Aug. 1969, Secretary of Agriculture Clifford M. Hardin and Secretary of Health, Education and Welfare Robert H. Finch announced that an agreement had been reached that USDA would soon issue revised recommended standards for manufacturing milk.

A proposed revision of the requirements for milk for manufacturing purposes and its production and processing recommended for adoption by States was published by USDA in the Federal Register, Oct. 25, 1969.¹⁴ This generated considerable interest; 92 letters of comment were received for review and consideration by both the Department of Health, Education and Welfare and the U.S. Department of Agriculture.

Of the 13 States commenting, a majority agreed on the following items:

- (a) Use of a farm permit system rather than the farm certification system as contained in the 1963 standards.
- (b) Delete the provisions for an automatic drop in the maximum bacterial level for No. 2 (acceptable milk) from individual farms from 3 million to 1 million per milliliter in 3 years after adoption by a State.
- (c) Permit the continued use of the methylene blue test to estimate bacteria.
- (d) Eliminate the requirement that producers check strength of the sanitizing solutions.
- (e) Make requirements for farm water supplies less stringent.
- (f) Require that laboratory test records on milk quality only be maintained for review by inspectors.
- (g) Eliminate the recommendation that commingled milk in plant storage tanks have a bacteria count no greater than 3 million per milliliter.

The remaining 79 letters were from producers, processors, and trade organizations. In general, their views supported those of the States.

Careful consideration was given to each letter received. The views and opinions expressed were then weighed in light of what is known of industry capability and in the proportion of the industry then meeting the recommended requirements. The fact that certain States and areas were unable at that time to adopt and apply the recommended requirements did not alter the significance nor the need for uniformity in the sanitary quality of manufacturing milk and its products. Instead, it was felt that these should assess their situation and use all means necessary to systematically improve conditions, step by step, to the point where the recommended requirements could be met.

Action was taken on the views and comments received. The use of either term, whether it be farm certification or farm permit, would not alter the basic concept in the recommended requirements that an established criteria must be complied with as a basis for issuance and continuance of either a permit or certification. For these reasons, the term certification was retained in the text.

Considerable apprehension was expressed about the provision to automatically reduce the maximum level of bacteria in acceptable milk from 3 million to 1 million in 3 years after adoption of the requirements. Certain areas might not have a sufficient basis by which to judge whether they could meet this drop in the specified time. Therefore, this recommended requirement was footnoted to indicate that it would be reviewed in 3 years and, if warranted, a further extension may be granted.

The methylene blue test for estimating the bacterial content of milk has been demonstrated to be the least conclusive test when compared with the standard plate count, the direct microscopic count, and the resazurin reduction test. Because of its poor correlation with the other three test procedures, the methylene blue test was not included as a recommended test. This is not to say that some benefit could not be derived from its use in upgrading the quality of milk.

The recommendation to have producers check the strength of their sanitizing solutions was dropped, as it was felt that proper use of sanitizing solutions could be achieved by following the directions of the manufacturer.

Dairy farm water supply requirements were changed slightly. For reasons of public health significance and for safety of the farm family and the public in general, it was felt that farm water supplies should, at least for the time being, meet the State requirements, and that in cases where they did not meet the State requirements, such sources of farm water supplies should be upgraded to meet the requirements any time that unsatisfactory test samples were obtained, when repairs or reconstruction was necessary, or when any new source was constructed. States should be able to upgrade farm water supplies so that they could comply with the construction requirements.

The only test records which were recommended to be kept for routine review by inspectors were those which pertain to sediment and bacterial tests on milk from producers, pasteurization recorder charts, and water supply and health certificates. This recognizes privacy of in-plant quality control tests and other test results from routine surveillance.

The requirement was retained that, when milk from individual farms is commingled in dairy plant storage tanks, the commingled milk shall not have a bacterial content higher than 3 million per milliliter. The reason for retention was that some means is necessary to determine if the milk after being received from the farm is properly refrigerated and promptly handled in a sanitary manner until processed.

The manufacturing milk standards as reconstructed were published in the Federal Register, Apr. 7, 1972¹⁵. USDA has no legal responsibility for the enforcement of these recommended requirements within a State. This is the responsibility of each State when the requirements are adopted by a State. However, under authority granted it by the Agricultural Marketing Act of 1946, USDA will continue to assist the States in an advisory and interpretive capacity in order to promote the purpose and intent for which these requirements have been published. In addition, USDA will continue to review the progress being made toward adoption of these recommendations to include additional time limitations for implementation. These recommended standards were developed by Floyd Fenton, Eugene McGarrahan, and Richard Webber.

MEMORANDUM OF UNDERSTANDING BETWEEN THE
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
AND THE DEPARTMENT OF AGRICULTURE

In 1967 there surfaced a jurisdictional dispute between the U.S. Public Health Service, HEW, and the Consumer and Marketing Service, USDA, concerning the issuance of standards for instant nonfat dry milk and for farms producing manufacturing grade milk. A resolution of the dispute culminated in a Memorandum of Understanding signed by the Secretaries of Agriculture, and Health, Education, and Welfare on Jan. 15, 1968, and published in the Federal Register, May 4, 1968.¹⁶

The policy agreement reached served as a basis for the development of consistent regulations and recommendations for standards and ordinances covering instant nonfat dry milk and for farms producing manufacturing grade milk.

Under the terms of this policy agreement, the U.S. Public Health Service would continue to publish revisions of its recommended ordinance and code in regard to Grade A fluid milk and Grade A dry milk products used in Grade A pasteurized milk and milk products.

For instant nonfat dry milk for household use or for institutional use, standards were to be established which would approximate those of the USPHS recommended bacterial count for Grade B milk received at the plant. Only commingled milk which met those standards was to be used for the production of instant nonfat dry milk.

The USPHS recommended ordinance and the USDA recommended minimum standards for farms producing manufacturing grade milk were to be consistent and were to include mandatory farm inspection. They were also to include inspection of milk from individual farms at the primary receiving station. Where the primary receiving station is the same as the dry milk manufacturing plant, the prevailing USDA practices for handling probational or unacceptable milk, on the basis of the standards to be set, were to be applied. Otherwise, milk received at primary stations approaching or exceeding the maximum allowable limits of bacterial count, sediment, and other criteria would be cause for additional farm inspection. Enforcement of farm standards must be left to the State or local authorities.

The standards for plant equipment and good manufacturing practices for instant nonfat dry milk contained in the USPHS recommended ordinance and the USDA and FDA regulations for plant maintenance and inspection, were to be in agreement on all criteria in an explicit manner.

When the above technical agreements were reached, the USPHS was to include in its recommended ordinance and code for instant nonfat dry milk, a statement that the State or communities might accept USDA plant inspection and the USDA "Extra Grade" shield as evidence of compliance with the requirements for the raw commingled milk and with the standards for plant equipment and operation.

It was agreed that the standards were to be made progressively more stringent. Conferences of industry and Government representatives were to periodically meet to work towards this goal. The technical staff of both agencies were to discuss labeling of the nonfat dry milk products. USDA, USPHS, and FDA should be consistent on this point.

GENERAL INSTRUCTIONS FOR PERFORMING FARM INSPECTIONS¹⁷

The AMS Dairy Division, with the help of the Manufacturing Milk Committee, Dairy Division, National Association of State Departments of Agriculture, developed and published "General Instructions for Performing Farm Inspections." The "General Instructions" are intended for use in the proper interpretation of the Farm Requirements for Milk for Manufacturing, Subpart D of Milk for Manufacturing Purposes and Its Production and Processing, Recommended Requirements for State Adoption. The availability of the "General Instructions," coupled with members of the Standardization Branch working on-site with State inspectors and representatives of industry should bring about uniformity in the application of the farm requirements, as well as improvement in the production, handling, and quality of milk for manufacturing. Participation by members of the Standardization Branch is further discussed under Federal-State Relations in Chapter 19. It is intended that the individual States use the "General Instructions" to evaluate their program and make improvements where necessary to achieve uniformity with other States. Industry can use the "General Instructions" as a guide to improving and maintaining appropriate conditions in the production, handling, and quality of milk for manufacturing.

It is widely accepted that the bacterial count of milk is an index of the sanitary quality. The essentials of producing milk of low bacterial counts are generally considered to be clean, healthy cows, clean milking procedures in sanitary surroundings, clean utensils subjected to proper bactericidal treatment and drying, and prompt cooling of the milk to sufficiently low temperatures, and limited storage before delivery to the processing or manufacturing plant.

Specifically the "General Instructions" deal with the following farm inspection items: health of herd; water supply; sewage disposal; combination milking parlor and milkroom; milkhouse/milkroom; utensils and equipment; bulk milk and can milk; barn or milking area; yard, loafing area, or premises; and milking procedures.

The requirements for each item are enumerated and appropriate statements of "interpretation" and "justification" are carefully detailed; for example, the "requirement" of a safe, clean and ample water supply stipulates that:

The dairy farm water supply shall be properly located, protected, and operated, and shall be easily accessible, ample, and of safe, sanitary quality for the cleaning of dairy utensils and equipment. The water supply shall come from a source which is approved by the State regulatory authority; or from a spring, dug well, driven well,

bored well, or drilled well, the water from which complies with the standards of the State regulatory authority. A source that does not conform with the construction requirements of the State regulatory authority, but is tested annually by an approved laboratory and found to be safe and of sanitary quality shall be satisfactory: Provided, that after adoption of this regulation any new sources of water supply or any farm water supply requiring repairs or reconstruction or any source from which tested samples have been found unsatisfactory shall meet the construction requirements of the State regulatory authority.

The "interpretation" of this requirement is shown as:

The farm water supply shall come from a source approved by the appropriate State regulatory authority. If not approved it shall be tested annually. The water supply shall be safe and of a sanitary quality, properly located and protected. If a State has a well or water code check to see if the farm water supply complies. If a State has no farm water supply requirements or does not enforce them for manufacturing grade milk farms, or if the water supply has not been tested annually and found safe, then check this item as being unsatisfactory. The Manual of Individual Water Supply Systems should be utilized for further guidance.

The "justification" of this requirement is given as:

A dairy-farm water supply should be adequate and accessible in order to encourage its use in cleaning operations; it should be adequate so that cleaning and rinsing will be thorough; and it should be of safe, sanitary quality in order to avoid the contamination of milk utensils. A polluted water supply, used in the rinsing of the dairy utensils and containers, may be more dangerous than a similar water supply which is used for drinking purposes only. Bacteria grow much faster in milk than in water, and the severity of an attack of a given disease depends largely upon the size of the dose of disease organisms taken into the system. Therefore, a small number of disease organisms consumed in a glass of water from a polluted well may possibly result in no harm, whereas, if left in a milk utensil which has been rinsed with the water, they may, after several hours' growth in the milk, increase in such numbers as to cause disease when consumed.

The material contained in the "General Instructions" was prepared by Richard Webber.

GUIDELINES FOR THE CONTROL OF ABNORMAL MILK
AND SCREENING TESTS FOR ITS DETECTION

USDA recognizes the public health, economic and esthetic importance of controlling abnormal milk. To bring this problem into sharper focus, a publication was prepared by personnel of the Standardization Branch, after consultation with the Inspection and Grading Branch, furnishing guidelines as a convenient reference for plant managers, laboratory personnel and fieldmen.¹⁸

The responsibility and authority for regulation of abnormal milk rests with the individual States. Therefore the Department encourages those State regulatory agencies which have not developed such control programs to do so as to assure uniformity on a national basis. USDA also supports the programs of the National Mastitis Council and recommends that they be followed by industry and the regulatory agencies in order that clean, safe, wholesome milk be produced from healthy animals.

The "USDA Recommended Requirements for Milk for Manufacturing Purposes and Its Production and Processing, for Adoption by State Regulatory Agencies," and the "General Specifications for Dairy Plants Approved for USDA Inspection and Grading Service," require that "abnormal milk" be rejected until satisfactory compliance is obtained. In these documents milk is defined as "the normal lacteal secretion practically free from colostrum, obtained by the complete milking of one or more healthy cows." Excess numbers of somatic cells in milk are considered to be an indicator of inflammatory, infectious, or physiological conditions within the udder producing abnormal milk.

To comply with the applicable requirements and specifications of these two documents, the industry and/or a regulatory agency must have an established testing program in which each producer's milk is tested for antibiotic residues at least four times in 6 months. Also, the regulatory agency must have a program in which producer's milk is tested for pesticides and other chemical agents. The testing must be at a frequency to assure the regulatory agency that the milk supply does not contain such agents.

To make the USDA voluntary plant inspection program consistent with the abnormal milk program for State adoption, a memorandum dated Sept. 7, 1976, was sent by Herbert L. Forest, Director, AMS Dairy Division, to managers of dairy manufacturing plants to implement this program, as part of the guidelines publication. The plant managers were advised that USDA intends to implement this program under its voluntary plant inspection program and also to work cooperatively with the States to assist them in establishing and implementing the same program. Under the voluntary program USDA will implement the abnormal milk program in an orderly manner over a 3 year period as follows:

By July 1, 1977, plants receiving milk from producers should be running screening tests and have a program for producer follow-up and education.

By July 1, 1978, plants shall be running at least 4 screening tests in each 6 month period, confirmatory testing shall be

performed, as necessary, and warning letters of excessive somatic cell counts (over 1,500,000 cells per ml) shall be sent to applicable producers. A follow-up and educational program shall be established. At this time the abnormal milk program will be considered along with other deficiencies in determining plant status.

On July 1, 1980, full implementation shall be in effect. When two of the last four consecutive somatic cell counts exceed 1,500,000 cells per ml the appropriate State regulatory authority shall be notified and a written notice given to the producer. This notice shall be in effect so long as two of the last four consecutive samples exceed 1,500,000 cells per ml. In addition to the written notice an inspection shall be made of the farm facility to assist the producer in any way possible. If corrections are not made during the probationary period the producer's milk shall not be accepted.

The "Guidelines" also include detailed procedures for conducting screening and confirmatory tests in testing for mastitis. The procedures were reprinted by permission of the American Public Health Association from Standard Methods for the Examination of Dairy Products.

The material contained in the "Guidelines" was prepared by Richard Webber and Joseph Rubis.

¹ 15 F.R. 5475.

² 15 F.R. 8933.

³ U.S. Agricultural Marketing Service, Dairy Division. Notes on USDA Recommended Quality Requirements for Milk for Manufacturing, 2 pp., Sept. 23, 1959. Available in Poultry and Dairy Quality Division, FSQS, USDA.

⁴ U.S. Agricultural Marketing Service, Dairy Division. Some Notes on Meeting with ARS Officials Concerning Development of Code on Production Requirements for Manufacturing Milk, 1 p., Sept. 24, 1958. Available in Poultry and Dairy Quality Division, FSQS, USDA.

⁵ 50 Stat. 1087.

⁶ U.S. Agricultural Marketing Service, Dairy Division. Attendance at USDA Conference to Discuss Proposed Production Requirements for Manufacturing Milk and Minimum Specifications for Dairy Plant Operations, 2 pp., Apr. 28, 1959. Available in Poultry and Dairy Quality Division, FSQS, USDA.

⁷ U.S. Agricultural Marketing Service, Dairy Division. Attendance at USDA Conference to Discuss Proposed Quality Standards for Manufacturing Milk and Plant Specifications, 1 p., May 26, 1959. Available in Poultry and Dairy Quality Division, FSQS, USDA.

- ⁸ U.S. Agricultural Marketing Service, Dairy Division. Meeting of Committee to Consider Recommended Quality Standards for Milk for Manufacturing Purposes, 9 pp., November 14, 1961. Available in Poultry and Dairy Quality Division, FSQS, USDA.
- ⁹ U.S. Agricultural Marketing Service, Dairy Division. Attendance at USDA Conference to Discuss Proposed Quality Standards for Manufacturing Milk and Plant Operations, 1 p., April 4, 1962. Available in Poultry and Dairy Quality Division, FSQS, USDA.
- ¹⁰ H.L. Forest. Quality Standards for Milk for Manufacturing, October 1959, at Annual Meeting of National Association of State Departments of Agriculture, Nashville, Tennessee. Available in Poultry and Dairy Quality Division, FSQS, USDA.
- ¹¹ H.L. Forest. The Development of National Minimum Quality Standards for Milk to be Used in Manufacturing, Feb. 18, 1960, at Annual Meeting of Dairy Products Improvement Institute, New York, N.Y. Available in Poultry and Dairy Quality Division, FSQS, USDA.
- ¹² U.S. Agricultural Marketing Service, Dairy Division. Meeting of Committee to Consider Modifications of Certain Provisions of the Proposed Minimum Standards for Milk for Manufacturing Purposes, 2 pp., Oct. 26, 1962. Available in Poultry and Dairy Quality Division, FSQS, USDA.
- ¹³ 28 F.R. 6580.
- ¹⁴ 34 F.R. 17360.
- ¹⁵ 37 F.R. 7046.
- ¹⁶ 33 F.R. 6835.
- ¹⁷ U.S. Agricultural Marketing Service, Dairy Division. General Instructions for Performing Farm Inspections..., 23 pp., Aug. 1, 1976. Available in Poultry and Dairy Quality Division, FSQS, USDA.
- ¹⁸ U.S. Agricultural Marketing Service, Dairy Division. Guidelines for the Control of Abnormal Milk..., 18 pp., Nov. 1, 1976. Available in Poultry and Dairy Quality Division, FSQS, USDA.

USDA REQUIREMENTS AND SPECIFICATIONS FOR DAIRY PLANTS

When the inspection and grading program for dairy products was inaugurated in 1919, the service was rendered at central markets and limited chiefly to the grading of finished products. This type of service had been constructive, to a degree, with respect to quality, by focusing attention on quality improvement. However, the program permitted only minimal assistance to the manufacturing plants in quality assurance and product safety.

This picture began to change in 1924 when resident inspection and grading service was introduced at butter assembling warehouses, which allowed a closer working relationship with the individual creameries. This program was expanded in the thirties with some requests for quality control service in conjunction with the grading operation.

During World War II, many of the USDA dairy products inspectors were called upon to assist creameries and cheese factories in manufacturing products that would meet Government quality standards. In the immediate postwar period, an interest developed in the utilization of USDA resident inspection service at pasteurized process cheese plants, followed by a demand for resident grading and quality control service at individual dairy products manufacturing plants. These requests required the development of applicable requirements and specifications, which became operative in 1946 and 1948, respectively. The 1948 requirements for individual dairy products manufacturing plants were updated in 1955.

The plant survey program which began in 1951, was well received by the dairy industry and users of dairy products. In 1963, plant approval became a prerequisite to USDA inspection and grading service. As a result, a set of comprehensive specifications were developed and made available in 1967.

REQUIREMENTS FOR PASTEURIZED PROCESS CHEESE PLANTS

Bennett J. Ommodt and Harold E. Meister, after consultation with members of the National Cheese Institute and other interested parties, issued in mimeograph form a set of requirements applicable to pasteurized process cheese plants operating under USDA inspection, effective Aug. 1, 1946, (109).

Prior to the inauguration of continuous inspection, a representative of the Dairy and Poultry Grading and Inspection Division, PMA, at the request of the applicant, surveyed the premises, plant, facilities, equipment, raw material, and operating procedures to determine whether or not the total operation would qualify for official USDA resident inspection. Plants having adequate facilities and found to otherwise meet the instructions were eligible to operate under the continuous inspection service. They were assigned a plant number and were permitted to identify their product with the official

identification. Plants operating under official inspection were required to be maintained in a sanitary condition and comply with provisions of the general requirements relating to ten specific areas:

1. Premises and Plant. The premises were required to have an efficient drainage system and be maintained in a condition suitable for a food processing operation. The plant was to be maintained in a sanitary condition; possess abundant light of good quality and well distributed; with adequate ventilation, efficient drainage and plumbing service; and an ample water supply of a safe, sanitary quality, well distributed within the plant. The walls, ceilings, floors, partitions, doors, and other parts of all structures constituting the plant were to be of such materials and construction as to permit efficient and thorough cleaning; the floors were to be constructed of tile, concrete, or other impervious material, free from cracks or rough surfaces. Every practicable precaution was to be taken to exclude flies, rodents, and other vermin from plant. The preparation of raw materials was to be handled in separate and distinct rooms from those used for processing and packaging.

2. Facilities. Adequate sanitary facilities and accommodations were specifically required, including dressing and toilet rooms that were properly located, lighted and ventilated; suitable washing facilities provided, as well as facilities for cleaning and sterilizing equipment and utensils.

3. Equipment and Utensils. All equipment used in the preparation of raw materials, processing, and packaging was to be constructed and designed to permit easy access to insure thorough cleaning and sterilization, and maintained in good condition.

4. Sanitary Requirements. The floors in plants were to be free from grease and litter and maintained in a clean, satisfactory condition. The equipment and utensils coming in contact with the product were to be cleaned and sterilized daily and maintained in a thoroughly sanitary condition. The grinders, shredders, cookers, conveyors, pumps, pipelines, package fillers, and any other equipment coming into contact with the product was to be disassembled for thorough cleaning and sterilization after each day's operation. Dressing rooms, toilet rooms and lavatories were to be maintained in a clean, orderly condition.

5. Personnel Health. All employees were to have a thorough medical and physical examination at least once a year by a registered physician. No person afflicted with any infectious, contagious, or communicable disease, or who was a carrier of such disease, was to be permitted employment in connection with the food-processing operation. Clean, white or light-colored uniforms were to be worn by all persons handling food product. Proper precautions were to be taken to avoid contamination of product. Clean habits were required of all employees and no smoking was permitted in rooms where unpacked product was prepared, processed, or otherwise handled.

6. Raw Materials. All natural cheese used in the manufacture of the pasteurized process cheese had to meet specific quality requirements. The natural cheese when ready for grinding was to be properly cleaned, free from exterior or interior mold, rind rot, cheese pests, or any other condition causing the product to be classified as inedible. Ingredients such as sodium chloride, emulsifying salts, or other materials were required to be wholesome.

7. Operating Methods and Procedures. The methods and procedures employed in the manufacturing operation were to be consistent with best commercial practices. The natural cheese was blended with respect to age, flavor development, and body condition to produce a finished product having acceptable flavor and uniform consistency. The addition of emulsifying salts was limited to such percentage as to prevent a noticeable emulsifier flavor in the finished product. The mass of product during the cooking process was heated to a temperature adequate for satisfactory bacterial destruction. The pasteurized process product after packaging was stacked so as to allow free circulation of air between individual packages for rapid cooling to normal room temperature. Inadequate cooling methods which permitted product to remain at a temperature in excess of 100 degrees F., 24 hours after packaging were considered unsatisfactory.

8. Manufactured Products. The manufactured products were to meet certain specifications with respect to flavor, body and texture, color, and finish and appearance; and be packaged in moisture-resistant material, properly and completely sealed under strictly sanitary methods and conditions.

9. Laboratory. A separate room, properly ventilated and lighted, was required to conduct essential laboratory tests, including composition of the finished product, and tests for extraneous matter on the raw materials and the finished product. Representative samples of product produced under continuous inspection were selected by the resident inspector and transmitted to the USDA laboratory for testing.

10. Official Identification Legend. Products processed under continuous official inspection of the U.S. Department of Agriculture and meeting specified requirements were eligible for labeling with the official identification legend. This consisted of the following statement: "Processed and Packed Under Continuous Inspection of the U.S. Department of Agriculture." Wrappers, packaging materials, or labels bearing official identification legend were required to have prior approval of USDA.

The requirements for cheese processing plants operating under official resident inspection service were refined and detailed in the mid-sixties. They were given greater specificity and updated in the document, "General Specifications for Dairy Plants Approved for USDA Inspection and Grading Service," May 16, 1967.

INSTRUCTIONS GOVERNING OPERATIONS OF OFFICIAL PLANTS

An industry interest developed in 1947 for the development of a USDA performance code applicable to individual dairy products manufacturing plants. A set of applicable "Instructions" was developed by B.J. Ommundt and H.E. Meister and discussed with members of the American Butter Institute, American Dry Milk Institute, Evaporated Milk Association, and the National Cheese Institute, at a meeting in Chicago, in Jan. 1948. The Instructions were also discussed with officials of State Departments of Agriculture, college workers and other interested parties.

The Instructions were subsequently modified and published in the Federal Register, Mar. 23, 1948, under proposed rule making,¹ and in final form Nov. 4, as "Instructions Governing Plants Operating as Official Plants Packaging and Processing Dairy Products," effective Dec. 4, 1948.²

These Instructions introduced a new USDA program offering inspection and grading service to all segments of the dairy industry on a continuous, year-round basis. This service was provided to dairy plants on a voluntary basis, subject to plant survey and approval, and was intended to help industry supply wholesome, dependable, standardized dairy products, uniform in quality from day to day.

Dairy products processed and packaged under continuous USDA inspection and meeting specific quality requirements, were eligible to be identified with the appropriate U.S. grade mark or inspection shield.

Inspection and grading service under the program required a technically trained and qualified inspector to be stationed at the plant. His duties included the checking of raw materials, operating methods and procedures, and sanitary practices, as well as the official sampling or grading of the finished products.

The Instructions defined dairy products as butter, cheese (whether natural or process), milk, cream, and milk products (whether dry, evaporated or condensed). Basically the requirements for premises, plant, facilities, sanitation, equipment, and operating procedures were similar to those previously specified for pasteurized process cheese operations. Requirements for the quality of the milk or farm-separated cream were also specified.

Twice each month, a single can of raw milk, selected at random, from each producer was tested for sediment at the official plant, in accordance with the "off-the-bottom" method of sediment testing. The milk was classified into one of three categories:

Standard Disc No. 1 equivalent to 0.0 mg. of sediment
Standard Disc No. 2 equivalent to 0.5 mg. of sediment
Standard Disc No. 3 equivalent to 2.50 mg. of sediment

Milk containing sediment content in excess of Standard Disc No. 2 was not permitted to be used for manufacture or processing into dairy products, except that milk in excess of Standard Disc No. 2 was allowed to be accepted for a 10-day probationary period, while corrective action was taken.

The standard industry photographic sediment content chart (based on the three sediment levels shown above) was used for rating the sediment discs, which were designed to be read to the nearest sediment disc; thus a sediment disc judged to have a sediment content of up to 1.50 mg. of sediment would be classified within the limits of Standard Disc No. 2.

At least twice each month a mixed sample of each producer's milk was tested for bacterial content. The methylene blue reduction test was the one most commonly used and the milk was classified according to the following:

- Class 1 - Decolorized in 3 1/2 hours
- Class 2 - Not decolorized in 2 1/2 hours but is decolorized in less than 3 1/2 hours
- Class 3 - Not decolorized in 1 hour, but is decolorized in less than 2 1/2 hours
- Class 4 - Decolorized in less than 1 hour

Milk containing bacterial content in excess of Class 2 was not permitted to be used for manufacture or processing into dairy products, except that milk in excess of Class 2 was allowed to be accepted for a 4-week probationary period, during which time corrective action was necessary.

When the producer's milk was placed in Class 4, such milk was to be kept apart from the raw milk eligible for use in the manufacture or processing into dairy products.

Any raw milk showing an abnormal condition (e.g. curdled, ropy, clotted, or unwholesome) was not permitted to be used for manufacture or processing into dairy products.

The quality and condition of farm-separated cream was determined by an organoleptic examination. Any farm-separated cream that showed an abnormal or unwholesome condition was kept apart from the farm-separated cream which was permitted to be used for manufacturing or processing into dairy products.

All raw milk and farm-separated cream while in transit from the farm to the official plant was required to be adequately protected from extreme temperatures, dust, and other adverse conditions.

Operations in receiving, transporting, segregating, holding, processing, packaging, and storing dairy products were to be conducted in accordance with clean and sanitary methods, as rapidly as practicable, and at temperatures that would not tend to cause any material increase in bacterial content or any product deterioration or contamination.

All dairy products were subject to continuous inspection throughout each processing operation. All substances and ingredients used or added in the processing of any dairy product were required to be clean and suitable for human food.

The methods and procedures employed in receiving, segregating, and processing raw materials in an official plant were to be adequate to result in a satisfactory finished product.

Packages or containers for dairy products were to be clean when being filled with any such products and all precautions taken to avoid product contamination.

No person affected with any communicable disease in a transmissible stage was to be permitted in any room or compartment where exposed or unpacked dairy products were prepared, processed, or otherwise handled. Spitting or smoking was prohibited in all such rooms or compartments.

Final inspection of dairy products required that representative samples from each lot of dairy products be inspected for class, quality, and condition by the official resident inspector.

Official identification was reserved only for those dairy products manufactured or processed in accordance with the official USDA instructions and requirements. Sketches, proofs, or photostatic copies of all proposed packaging materials, grade labels, and inspection marks to be used as official identification were to have prior approval of the USDA.

C.J. Babcock and D.R. Strobel reviewed the 1948 instructions and, after consultation with industry and other interested parties, prepared a revision which was published in the Federal Register, Feb. 8, 1952, under proposed rule making.³ On Apr. 26, 1952, USDA announced in the Federal Register that it was withdrawing the proposed revision of Instructions Governing Dairy Plants Operating Under United States Department of Agriculture Supervision and Inspection.⁴

MINIMUM SPECIFICATIONS FOR APPROVED PLANTS

B.J. Ommodt, H.E. Meister, Edward Small, and F.E. Fenton upgraded the 1948 instructions in Feb. and Mar. of 1955 and held eight meetings with members of the industry from New York City to Omaha, Neb.⁵ Some in the industry were opposed to the establishment of a USDA resident inspection and grading program. They expressed the danger of a voluntary resident inspection program evolving into a mandatory one. They also feared that any attempt to establish raw milk standards for the entire industry would result in something they could not live with.

After considerable study of the many comments and suggestions received at these meetings, the USDA dairy product specialists developed a new document, entitled, "Minimum Specifications for Approved Plants Manufacturing, Processing and Packaging Dairy Products." These minimum specifications were published in the Federal Register, Aug. 10, 1955, under proposed rule making,⁶ and in final form Nov. 11, effective Dec. 11, 1955.⁷

The minimum specifications were more detailed than the instructions which they superseded. The following covers the important changes and additions:

An "approved laboratory" was defined as one in which the entire facilities and equipment had been approved by the Administrator as being adequate to perform the necessary official tests in accordance with the prescribed rules and regulations.

An "approved plant" was defined as one or more adjacent buildings, or parts thereof, comprising a single plant at one location in which the facilities and methods of operation therein have been approved by the Administrator as suitable and adequate for operation under inspection or grading service in accordance with prescribed regulations.

The term "cream" was defined as that portion of milk which is produced by healthy cows in herds fully accredited as tuberculosis-free by the USDA and which rises to the surface on standing or is separated by centrifugal force and contains not less than eighteen percent of milk fat.

The term "dairy products" was modified and defined as meaning butter, cheese (whether natural or process), milk, cream, milk products (whether dried, evaporated, stabilized or condensed), ice cream, dry whey, dry buttermilk, and such other perishable dairy products as the Secretary of Agriculture may designate. This term also included any food product prepared or manufactured from any of the aforesaid products if such products constituted at least 50 percent, by weight, of all the ingredients used in the preparation or manufacture of the food product. Such food products were not to contain any fats except milk fats.

The term "grader" was defined as meaning any employee of the Department authorized by the Secretary, or any other person to whom a license had been issued by the Secretary, to investigate and certify to shippers of products and other interested parties the class, quality, quantity, and condition of such products.

The term "inspector" was defined as meaning any employee of the Department authorized by the Secretary, or any other person to whom a license had been issued by the Secretary, to inspect and certify quality, quantity, and condition of products, to supervise the operation in an approved plant and perform plant surveys.

The term "milk" was more specifically defined as meaning the whole lacteal secretion practically free from colostrum, obtained by the milking of one or more healthy cows located in modified tuberculosis-free areas or from cows in herds fully accredited as tuberculosis-free by USDA.

Any "plant approval" might be suspended for (a) failure to maintain plant and equipment in a sanitary and satisfactory operating condition, (b) the use of unwholesome raw material or use of operating procedures which were not in accordance with prescribed regulations, (c) failure to process or manufacture a stable product, (d) failure to maintain legal composition of the finished product, or (e) major alterations of buildings, facilities, or equipment, without prior approval by the Administrator of AMS.

Churns of wood construction were given only temporary approval, provided the wood was in sound condition. New equipment and replacements were required, where applicable, to meet the 3-A Standards. Equipment not covered by 3-A Standards was required to be approved by the Administrator of AMS.

A separate grading room or designated area was required for the inspection and grading of finished products. The grading room or area was to be suitably located, sufficient in size, well lighted, ventilated, with a temperature range preferably between 60 and 80 degrees F. and not below 50 degrees F.; and kept clean and dry, free from foreign odors and reasonably free from disturbing elements which would interfere with proper concentration by the grader. The grading room or area was to be equipped with a table or desk and facilities for washing hands.

An approved automatic flow diversion valve and holding tube was required on all high-temperature-short-time (HTST) pasteurization equipment, including vacuum type pasteurizers, to assure complete pasteurization. When vacuum type pasteurizers were used, the specifications required that the steam be conducted through a steam strainer and a steam purifier equipped with a steam trap. In addition, a negative phosphatase test on milk or cream was required.

Long stem indicating thermometers were required for checking temperatures of pasteurization and/or cooling products in vats and for checking the accuracy of recording thermometers. Short stem indicating thermometers were required to be installed in the proper stationary position in all HTST pasteurizers and all storage tanks where temperature readings were considered essential.

Air-space indicating thermometers were to be installed above the surface of the products pasteurized in vats to make certain that the temperature of the foam and/or air above the products pasteurized also received the required minimum temperature treatment. Recording thermometers were to be used on all vats or HTST equipment used for pasteurizing any milk or milk products, to record the temperature and time held.

Each plant was to be equipped with a heavy-duty industrial vacuum cleaner and regular schedules established for thoroughly vacuuming applicable equipment and areas in the plant. The material picked up by vacuum cleaners was to be disposed of promptly.

All farm bulk tanks were to meet 3-A Standards and be designed and equipped with refrigeration to cool the milk to 40 degrees F. or lower within 2 hours and maintain it below 45 degrees F. until picked up. The transfer of milk from tank to truck was required through stainless steel piping or approved hose under sanitary conditions so as not to detract from the quality of the milk in the tank. Facilities were required for adequate washing and sanitizing of tanks, piping and accessories, at central locations, or at all plants receiving or shipping milk or milk products in tanks.

The inspection of the raw milk for manufacturing or processing into dairy products was based on organoleptic examination and quality control tests for sediment content and bacterial estimate. Each can or farm bulk tank of milk was examined for wholesomeness and off-flavors, including those associated with developed acidity. Any raw milk that showed an abnormal condition or which showed significant bacterial deterioration was to be rejected and was not eligible for the processing or manufacturing of dairy products.

At least twice each month, one can of milk from each producer, selected at random, was tested for sediment content using the off-the-bottom method. The milk was classified into one of three categories.

- Class 1 - USDA Sediment Standard (not to exceed) 0.50 mg.
- Class 2 - USDA Sediment Standard (not to exceed) 1.00 mg.
- Class 3 - USDA Sediment Standard (not to exceed) 2.50 mg.

In the case of milk held in farm bulk tanks, a representative sample was taken for sediment testing and classified in accordance with the United States Sediment Standards for Milk and Milk Products.

At least twice each month a bacterial estimate was made on a mixed sample of each producer's milk by the methylene blue test, the resazurin test, the direct microscopic (clump) count or its equivalent. The milk was classified for bacterial estimate into one of three categories:

Bacterial estimate classification	Direct microscopic clump count	Methylene blue test mixed sample not decolorized in	Resazurin tests, color change beyond color represented by
Class 1	200,000 per ml.	5 1/2 hours	P-7/4 in 2 3/4 hours
Class 2	3,000,000 per ml.	2 1/2 hours	P-7/4 in 1 1/2 hours
Class 3	10,000,000 per ml.	1 hour	P-7/4 in 3/4 hour

Field service from the plants was required to assist the producer in the production of high quality milk. Bulk milk in storage tanks within the processing plant or receiving station was to be maintained at a temperature of 45° F. or lower until processed. Quality checks for bacterial estimate and flavor were to be made daily to make certain that the quality of the milk in the tanks was consistent with the milk received from the producers as shown by plant records.

The inspection of farm separated cream to be used for manufacturing or processing into dairy products was based on organoleptic examination and quality control tests to determine sediment content of each individual producer's cream at the time of delivery at the receiving plant or substation. Each can of cream in each shipment was examined for physical characteristics and off-flavors, including those associated with developed acidity. Any cream having pronounced off-flavors or in an abnormal condition was to be rejected.

At least twice each month one can of cream from each producer, selected at random, was tested for sediment content and classified into one of three categories (based on the off-the-bottom-method):

- Class 1 - USDA Sediment Standard (not to exceed) 0.50 mg.
- Class 2 - USDA Sediment Standard (not to exceed) 1.00 mg.
- Class 3 - USDA Sediment Standard (not to exceed) 2.50 mg.

As a supplement to the regular sediment testing procedure, provision was made for the utilization of whole-can filtering facilities for each can of each shipment of cream from the producer for coarse sediment or extraneous matter.

The cream was classified into one of three categories (based on the mixed-can method):

- Class 1 - USDA Sediment Standard (not to exceed) 0.20 mg.
- Class 2 - USDA Sediment Standard (not to exceed) 0.30 mg.
- Class 3 - USDA Sediment Standard (not to exceed) 1.00 mg.

The pasteurization of cream for buttermaking required a temperature of not less than 165 degrees F. for at least 30 minutes for the holding method, or not less than 185 degrees F. for at least 15 seconds for the HTST method, or any other temperature and holding time to assure adequate pasteurization and comparable keeping-quality characteristics.

Pasteurization of milk for cheesemaking, when practiced, required a temperature of at least 161 degrees F. for 15 seconds in approved and properly operating equipment.

The equipment, except that effectively cleaned-in-place, was to be disassembled daily for thorough cleaning. After reassembly and prior to use, all equipment coming in contact with milk or milk products was to be subjected to an acceptable bactericidal or sanitizing process. Utensils and portable equipment used in processing operations were to be stored above the floor in clean, dry locations and in a self-draining position on racks constructed of impervious, corrosion-resistant material.

Parchment liners for bulk butter packages were to be treated for protection against mold and other possible deterioration. The liners were to be completely immersed in a saturated salt solution, in a suitable non-corrosive container and held at the boiling point for not less than 30 minutes, and then held in the solution until used. The lined boxes were to be inverted until ready for use to afford protection from possible contamination.

The finished products, in the case of dry storage, were to be arranged in aisles, rows, or sections, or in such manner as to be easily accessible for inspection. Dunnage or pallets were to be used when practical. Control of humidity and temperature was at all times to be consistent with good commercial practices. In the case of refrigerated storage, the finished products were to be placed on dunnage or be palletized and stored under temperatures to best maintain the initial quality.

GENERAL SPECIFICATIONS

New concepts in plant design, methods of processing, handling and packaging product required a review and updating of the 1955 Minimum Specifications for Approved Plants Manufacturing, Processing and Packaging Dairy Products. A comprehensive revision of the minimum specifications was started in 1964 by Floyd Fenton, Robert Anderson, and Eugene McGarrahian.

Initially, draft copies of a proposed revision were distributed to USDA Dairy Division personnel, resident plant managers, and to dairy products manufacturers who utilized the official plant survey service. After receiving comments, a revised draft was resubmitted in Feb. 1965 for further comments

and suggestions. At the same time copies were made available to State Departments of Agriculture, University staffs interested in the dairy field, and to the various national dairy industry trade associations. The new document was published in the Federal Register, Sept. 16, 1966, under proposed rule making as General Specifications for Dairy Plants Approved for USDA Inspection and Grading Service.⁸ Interested parties were afforded 90 days to submit written data, views or arguments for USDA consideration, and the specifications were published in final form in the Federal Register, Mar. 17, 1967, effective May 16, 1967.⁹

The primary objectives of the general specifications were to establish improved guidelines for dairy plants in which the facilities and methods of operation aid the operators to manufacture more consistently wholesome, uniform high-quality, and stable dairy products. The scope and direction of the general specifications represented an expanded and different concept, one which emphasized what a good dairy plant should be and how to attain an even higher level of performance.

The general specifications established a method for checking the quality of raw milk received at the dairy plant and for improving the overall quality of the milk supply. The minimum quality levels set and the length of time given to the producer to bring his milk supply above the probationary stage were fair and realistic. A 3-million bacteria count in milk represented a fair cut-off point, and 4 weeks provided ample time for a producer to correct an unsatisfactory situation, if he had any prideful interest in the matter. A good milk producer is like a good gardener: it is not enough that he love flowers; he must also hate weeds.

The matter of heat treatment and pasteurization received increased attention; for example, high-temperature short-time pasteurization units, to assure complete pasteurization, had to be equipped with proper controls. After the HTST unit had been tested according to the 3-A Accepted Practices, the timing pump and the recorder-controller were sealed at the correct setting to assure pasteurization. Sealing of the HTST unit was performed by the control authority having jurisdiction.

In addition to covering raw milk supply, plant premises, buildings, facilities, equipment and utensils, cleanliness and health, operating procedures, and packaging and storage of product, the general specifications also contained eight supplemental sections.

The general requirements applied to all plants regardless of the product manufactured and the supplements related specifically to a certain major dairy product or a group of products. Together, they provided a comprehensive plant approval program; for example, for a butter plant the general requirements and the appropriate supplemental specification, in combination, provided a complete set of guidelines for the manufacture, handling, packaging and storage of butter and related products. In dairy plants where both butter and milk powder are made, a supplement outlines the requirements for the manufacture of nonfat dry milk, dry whole milk, dry buttermilk, and dry whey.

Product definitions are given, as well as requirements, for special processing rooms and equipment, raw material, operations, and operating procedures. Also, special quality requirements apply for products that are officially identified with a USDA quality approved inspection shield.

The eight supplements are:

1. Specifications for Plants Manufacturing, Processing and Packaging Nonfat Dry Milk, Dry Whole Milk, Dry Buttermilk and Dry Whey.
2. Specifications for Plants Manufacturing, Processing and Packaging Butter and Related Products. The related products are: Butteroil, Anhydrous Milkfat, Frozen Cream, Plastic Cream, and Whipped Butter.
3. Specifications for Plants Manufacturing and Packaging Cheddar Cheese and Similar Varieties. The similar varieties are: Colby, Granular, Stirred Curd, Washed Curd and Soaked Curd Cheese.
4. Specifications for Plants Manufacturing and Packaging Cottage Cheese.
5. Specifications for Plants Manufacturing, Processing and Packaging Ice Cream and Related Products. The related products are: Frozen Custard, Ice Milk, and Fruit Sherbet.
6. Specifications for Plants Manufacturing, Processing and Packaging Pasteurized Process Cheese and Related Products. The related products are: Pasteurized Process Cheese Food, and Pasteurized Process Cheese Spread.
7. Specifications for Plants Processing, Manufacturing and Packaging Milk or Milk Products. For the purpose of this supplement the milk and milk products covered were those listed in Part 1, Section 1, Definitions, "Grade A Pasteurized Milk Ordinance," 1965 Recommendations of the United States Public Health Service.
8. Specifications for Plants Manufacturing, Processing, and Packaging Evaporated, Condensed or Sterilized Milk Products. The condensed milk refers to plain condensed and sweetened condensed milk. The sterilized milk products referred to sterilized milk concentrated, sterilized milk, sterilized chocolate (chocolate flavored) milk, and sterilized chocolate (chocolate flavored) drink.

Technological changes that have occurred in equipment, facilities, and manufacturing operations since 1967 required an updating and upgrading of the requirements contained in the general specifications to meet the needs of the dairy industry. A draft revision was prepared by Joseph Rubis, Richard Webber, and Roland Golden in the summer of 1974, based on USDA experience in its plant survey program and upon recommendations and comments received from the national dairy trade associations, Dairy, Food and Drug Committee of the National Association of State Departments of Agriculture, and others. All comments were carefully considered and a proposed revision of the general specifications was published in the Federal Register, Feb. 12, 1975, under proposed rule making,¹⁰ and in final form Oct. 10, 1975, effective Jan. 2, 1976.¹¹

The revision established requirements that more adequately assisted in determining the approval of dairy plants for inspection and grading service, consistent with good manufacturing practices. In general, the changes in the requirements may be summarized as follows:

1. Requirements were updated to reflect new developments in all segments of the dairy manufacturing industry.
2. Specifications for abnormal milk were added and the bacterial estimate classification system updated to agree with the USDA Standards for Milk for Manufacturing Purposes Recommended for State Adoption, Apr. 7, 1972.
3. The supplemental specifications for plants manufacturing, processing, and packaging milk or milk products were deleted since the responsibility for these products at the Federal level rests with the Food and Drug Administration.
4. Due to the importance of the developing industry for whey and whey products, new supplemental specifications for plants manufacturing, processing and packaging whey, whey products and lactose were included.
5. Additional equipment required to meet specifications of 3-A Sanitary Standards, where applicable, were referenced.
6. Editorial changes were made for clarity.

Some of the important specific changes and additions are shown below:

1. Dairy wastes are now required to be disposed of from the dairy plant and premises consistent with the National Environmental Policy Act of 1969.¹²
2. Internal return tubular heat exchangers are required to meet 3-A Sanitary Standards for Internal Return Tubular Heat Exchangers for Use with Milk and Milk Products. This was formerly a "should" item. Where the manufacturer chooses not to display the 3-A symbol, a USDA supervisor is assigned to make an evaluation of the equipment for USDA acceptance.
3. A new section has been added outlining requirements for testing abnormal milk and for follow-up when test results are unsatisfactory. The outlined requirements are the same as the recommendations of the National Mastitis Council and the Abnormal Milk Committee of the Interstate Milk Shippers Conference.
4. The bacteriological quality of commingled milk in storage tanks shall not exceed 3,000,000/ml. Full status plant rating is limited to plants which meet the 3 million requirement of at least two of the last three DMCC test averages.
5. The methylene blue test, no longer considered a satisfactory test method for determining the bacterial estimate classification of raw milk, was dropped. Requirements for bacterial estimate classification are now consistent with the counterpart section in the USDA Requirements for Milk for Manufacturing Purposes Recommended for State Adoption.

6. The section regarding evaporators and vacuum pans contains three major changes:

(a) New replacements units are required to comply with 3-A Sanitary Standards. This was formerly a "should" item.

(b) Wording is clarified to show that units with open type condensers are required to be equipped with an automatic level control, barometric leg, or so constructed as to prevent water entering the product.

(c) New wording covers re-use of "cow water" in the plant. This new section concerns permitted and prohibited uses of condensed water vapors which are removed from milk or dairy products during the process of vacuum evaporation. Such hot water recovered after extraction from the milk is termed "cow water."

7. Two new changes apply to spray dryers.

(a) Air filters are required to comply with applicable sections of the 3-A Accepted Practices for Milk and Milk Products Spray Drying Systems (No. 607-00).

This requirement applies to all driers, including those constructed prior to the development of the 3-A #607-00 which became effective Mar. 1972. The great majority of spray driers have already been provided with complying filters.

The probationary plant status is applicable for remaining drying operations which do not have the required filters.

(b) New or replacement drying systems or portions of systems replaced are required to comply with 3-A #607-00.

The applicable 3-A #607-00 is an "Accepted Practice" for a spray drying system; it is not a standard. The 3-A Symbol Council grants symbol authorization only when there is a 3-A equipment standard.

8. Conventional churning is required to be constructed of aluminum, stainless steel, or equally corrosion resistant metal, free of cracks, and in good repair.

This was formerly a "should" item which was interpreted to permit good condition wooden churning. The manufacture of wooden churning has been discontinued since the early fifties and any remaining wooden churning are considered obsolete, regardless of condition.

9. When a butter plant is experiencing problems with lipase or rancid flavors it is recommended that the Acid Degree Value (ADV) test be made on cream as often as is necessary to aid in the control of lipase activity. Similarly the Free Fatty Acid (FFA) test on butter is recommended.

10. New or replacement starter vats are required to be constructed according to the applicable 3-A Sanitary Standards. This was formerly a "should" item.

11. Requirements are added for automatic cheese making equipment. Criteria have been established for components of automatic cheese making equipment covering: automatic curd maker; curd conveying systems; automatic salter; automatic curd filler; hoop and barrel washer.

12. Three special classifications have been established for dry whey, based entirely on titratable acidity on a reconstituted basis.

13. Equipment for whey fractionation, such as ultrafiltration and reverse osmosis is required to be constructed in accordance with 3-A sanitary design principles, except where engineering requirements preclude strict adherence to such standards.

Manufacturers of membrane equipment have consulted with USDA about materials, design, and fabrication of units intended for dairy use.

RECOMMENDED STANDARDS FOR THE MANUFACTURE OF FROZEN DESSERTS FOR ADOPTION BY STATE REGULATORY AGENCIES

A study of State requirements for dairy plants processing mix or frozen desserts and requirements for the quality of milk and dairy products to be used in the manufacture of frozen desserts indicated the need for a uniform set of quality standards. While significant progress in improving frozen dessert quality has been accomplished, such progress has been uneven.

After discussions with industry representatives and State regulatory agencies, Floyd Fenton, Robert Anderson, and Eugene McGarrahan prepared a set of standards for the manufacture of frozen desserts recommended for State adoption, which were published in the Federal Register, Feb. 16, 1967.¹³

Following the initial publication of the recommended standards, statements were filed by the National Restaurant Association and representatives of the soft-freeze industry to the effect that the standards as presented did not fully recognize the nature of their business compared to that of the specialized dairy processor or manufacturer. They contended that the handling of soft-serve frozen desserts with other food items in drive-ins and restaurants should justify classing of soft-serve frozen desserts for inspection purposes under the same sanitation requirements as for general food items. It was on this premise that an amendment was issued in the Federal Register, June 16, 1967, recommending that the facilities and equipment relative to frozen desserts in restaurants, soft-serve stands and mobile units and other similar establishments be governed by the U.S. Public Health Service, "Food Service Sanitation Ordinance and Code" as published in USPHS Publication 934.¹⁴

After publication of the amendment, further comments were received and after consideration of all relevant matters, it was decided to republish the recommended standards including the provisions contained in the amendment and certain other editorial changes for clarification purposes. For instance, the definitions were changed for Frozen Desserts Manufacturers, Frozen Desserts Plants, and Mobile Units and a new definition was inserted for Frozen Desserts Retail Establishments.

Under this new definition, Frozen Desserts Retail Establishments were clearly exempted from the provisions of the recommended standards relating to Specifications for Licensed Frozen Desserts Plants, and Minimum Quality Standards for Milk to be Used in the Manufacture of Frozen Desserts, except for the sections pertaining to Procedures for the Examination of Frozen Desserts and Their Ingredients, and Quality Standards for Pasteurized Dairy Ingredients, Mix or Frozen Desserts.

The standards for the Manufacture of Frozen Desserts Recommended for Adoption by State Regulatory Agencies were designed to assure that processing methods and practices were adequate to attain higher quality and greater stability in the finished product, protect consumer health, and promote increased consumer acceptance of these products. The standards also provided an adequate and uniform basis for assessing the hygiene of processing methods. When they are adopted by a State, their enforcement becomes the responsibility of the appropriate regulatory authority. The adoption of practical sanitary standards, uniformly applied, would aid materially in upgrading the general sanitary level of frozen desserts.

There are variations in the quality of manufacturing grade milk in various areas of the country so that the effective enforcement of the recommended standards might require more time in some areas than in others. In order to facilitate immediate adoption of the standards, options were provided for delayed adoption, where necessary, for a period up to five years on provisions for minimum bacterial quality standards for milk to be used in the manufacture of mix and frozen desserts.

The recommended standards provided for definitions of all relevant terms and among other things:

Specifications for licensed frozen dessert plants (including premises, buildings, facilities, equipment and utensils);

Pasteurization of frozen dessert mix, cooling, storage, laboratory control tests, water supply, packaging and labeling;

Examination of frozen desserts and their ingredients;

Quality standards for raw milk and dairy products used as ingredients in frozen desserts;

Quality standards for pasteurized dairy ingredients, mix, or frozen desserts;

Plant inspection and labeling;

Quality standards for milk to be used in the manufacture of frozen desserts (sight, odor, sediment content and bacterial estimate);

Licensing of milk graders and bulk milk collectors.

The recommended standards also included a Sample State Enabling Act providing for the establishment of minimum Standards for the Manufacture of Frozen Desserts.

The final version of the Recommended Standards for the Manufacture of Frozen Desserts for Adoption by State Regulatory Agencies was published in the Federal Register, June 21, 1968.¹⁵

1 13 F.R. 1508.

2 13 F.R. 6497.

3 17 F.R. 1221.

4 17 F.R. 3746.

5 Office records. Available in Poultry and Dairy Quality Division, FSQS, USDA.

6 20 F.R. 5780.

7 20 F.R. 8444.

8 31 F.R. 12354.

9 32 F.R. 4204.

10 40 F.R. 6608.

11 40 F.R. 47910.

12 83 Stat. 852.

13 32 F.R. 2965.

14 32 F.R. 8683.

15 33 F.R. 9203.

EARLY INSPECTION AND GRADING ACTIVITIES

HISTORY

"Let the buyer beware" expresses a warning that became crystallized in the early common law of England and later in America as the doctrine of caveat emptor - "let the purchaser examine the article he is buying and act on his own judgment and at his own risk." The seller had no obligation under the ancient rule to reveal defects. (33, p. 265).

Before the 1870's, butter was bought and sold on an "over-the-trier," or a private negotiation basis. The first wholesale trade organization of the butter industry was established in New York City on June 1, 1873, (70, p.6).

Official commercial inspection of butter in this country dates back to at least 1879, when the first inspector was employed on the Chicago market by the wholesale trade organization known as the Chicago Produce Exchange, now the Chicago Mercantile Exchange.

USDA work in standardization and inspection began with shipments of dairy products to foreign markets in response to demands for disposal of surpluses.

INSPECTION OF DAIRY PRODUCTS FOR EXPORT

For more than a century, the United States had exported considerable quantities of butter to the British markets. Most of this butter had been of inferior quality and shipped without special care as ordinary ocean freight. The low average quality of the butter exported, together with large exports of butter substitutes during the 1880's and 1890's, had given foreign merchants, especially in Great Britain, the impression that good butter could not be obtained from the United States (35, p.83). The great fluctuations in the quantity of yearly exports had indicated that no regular supply from the United States could be depended upon.

Experimental exports by the Department starting in 1897 were designed, in part, to correct these erroneous opinions. The butter exported was made in accordance with special instructions from the Dairy Division, Bureau of Animal Industry (BAI), at creameries in Connecticut, Iowa, Kansas, Massachusetts, Minnesota, New Hampshire, New York, Ohio, South Dakota, Vermont and Wisconsin.

The English merchants were very satisfied with these experimental shipments of butter which were competitive with fine quality butter shipped from Denmark to Great Britain.

Special agents of the Department had visited Great Britain prior to the start of the experimental shipments, and, in 1898, visited France, Germany, China, Japan, the Hawaiian Islands, and the Phillipine Islands, for the purpose of making similar arrangements. The experimental exports of butter to all these countries were discontinued in May 1899 (97, 1899, p. 257).

In consequence of these favorable experimental results, Congress deemed it advisable to provide for the inspection of dairy products for export by enacting legislation on Mar. 2, 1901.¹ Accordingly, USDA instituted a system for inspecting dairy products offered for export, certifying to the character and quality of the articles. On Oct. 30, 1901, the Secretary of Agriculture issued applicable rules and regulations.

Fourteen separate rules were enumerated; rules one and six, respectively, are shown below:

1.-Owners and shippers of butter, cheese, or dairy products which are to be exported and who desire to have the said articles from time to time inspected and so marked 'as to secure their identity and make known in the markets of foreign countries...their purity and quality' shall make application in writing for such inspection, addressed to the Secretary of Agriculture.

6.-The inspector shall mark only such products as he finds to be pure and merchantable and of a quality and grade at least equal to the minimum standard to be prescribed for the product concerned from time to time, by the Secretary of Agriculture. During any one period this standard shall be uniform for all parts of the United States. If upon examination the inspector finds products of doubtful purity or in quality below the standard prescribed for the time being, he shall decline to place any mark thereon or give any certificate regarding the same (98).

The dairy trade journals took note of the inspection program and a representative accounting was contained in an editorial column of the Chicago Dairy Produce. It read in part as follows:

...The government is ready to begin the inspection and labeling of dairy products for export--that is pure creamery butter and full cream cheese. No other grades are to be inspected or certified as to quality at this time.

This is an experimental proceeding with the department and it has wisely decided not to make the inspections compulsory, but rather have it as a privilege by which the exporter of this grade of butter and cheese may give his goods an added standing in the markets abroad and so work toward a better understanding between dealers in England and the American producers.

The idea as thus far advanced has the endorsement and approval of practically all the large exporters in this market, and this being so it is probable that most of the finest creamery butter and cheese exported from this market or, more correctly speaking from the district for which Chicago is headquarters, will bear the neat label provided as a certificate of quality by the department (11, p.2).

The only reference to the use of this inspection program was contained in the Nineteenth Annual Report of the Bureau of Animal Industry (97, 1902, p. 44).

INSPECTION OF PROCESS OR RENOVATED BUTTER

Great quantities of butter were made on the farm during the last quarter of the nineteenth century and the first quarter of the current century. The quality of this farm-made butter was as varied as the number of individuals who made it. The surplus of country butter, particularly in the summer months, was a drug on the market and often times unsalable as butter.

In the early eighties, several persons in different sections of the country began melting butter, washing the oil and churning it in cold water or milk, then salting and working it like other butter. The product became known as renovated butter. It was not until the early nineties that renovated butter began to appear in any considerable quantities on the markets in this country.

The first attempt to control the sale of renovated butter in a legal way was made by the dairy and food commissioner of Pennsylvania in 1897 under that clause of the food law prohibiting the sale of any article of food under the name of another article. The Commissioner claimed that this butter was not genuine and should be sold under a distinctive name that was in a sense indicative of its nature (116, p. 396). The name "renovated butter" was unpopular with those engaged in its manufacture and sale, but the public took the position that it was proper and fair to compel dealers in articles of food to sell them for what they were.

In the 1890's, many millions of pounds of oleomargarine and renovated butter were sold annually as genuine butter. As a result of an aroused public opinion, the sale of oleomargarine, colored in imitation of yellow butter, was prohibited in a large majority of the dairy states, and laws requiring renovated butter to be marked and sold as such were passed (124, p. 397). National legislation was also sought, and what was familiarly known as the Grout bill, covering both the manufacture and sale of oleomargarine and renovated butter, finally became law May 9, 1902. This Act classified all butter under one of three grades or kinds as (1) butter, (2) renovated butter, and (3) adulterated butter.²

The law as applied to renovated butter provided for inspection of manufacturing plants, materials, and end product to be made by the Department of Agriculture (124, p. 397). These inspections were made by inspectors of

the Dairy Division, Bureau of Animal Industry. The Department, however, had no authority to destroy material intended for use in making renovated butter, even though it was unfit for human food. However, when such material was made up into renovated butter and then shipped in interstate commerce, the inspectors were legally able to condemn the entire product. Likewise, the BAI had no authority to establish mandatory sanitary regulations to govern plant operations. The applicable regulations were modified and became effective Aug. 15, 1907; the essential change was the granting of the privilege to use the word "process" in place of renovated (97, 1907, p. 255).

In 1904, 78 factories made a total of 60 million pounds of renovated butter (116, p. 398). While the manufacture of renovated butter was at one time an industry of considerable importance, it showed a steady decline from 1917 to 1931. In 1917, 22 factories located in 12 States produced over 27 million pounds as against five factories in five States that produced 1.5 million pounds of renovated butter in 1931 (80).

Prior to the enactment of the Act of June 24, 1946, Public Law 427, the Department of Agriculture lacked real authority over the manufacture of process or renovated butter.³ The 1946 Act provided the Department with ample authority to regulate the industry. Following this Act, the Department issued regulations, which became effective Jan. 27, 1947, for the inspection of process butter, including the ingredients entering into its manufacture, and for continuous sanitary inspection of the process butter plants.⁴ The Act and the regulations authorized the denaturing or destruction of any ingredient or process butter found to be putrid or decomposed or otherwise unfit for human food, by or under the supervision of an inspector. There were five factories manufacturing process or renovated butter in 1946 and two of them discontinued operations at the time the new regulations went into effect.

Starting in the mid-1920's the responsibility for the administration and supervision of the process butter program was assigned to the Bureau of Dairy Industry, USDA. The functions of the bureau were assigned to the Agricultural Research Service on Nov. 2, 1953, at which time the responsibility for administering the process butter operation was re-assigned to the Meat Inspection Division, ARS.^{5,6}

On Apr. 4, 1966, the administration of the process or renovated butter program was transferred to the Dairy Division, Consumer and Marketing Service, USDA. At that time there was only one process butter factory in the United States.⁷ It was located at Birmingham, Ala., and was actually operating only two days a week. The operations were gradually phased out and on Aug. 26, 1966, the plant was closed.⁸

INSPECTION OF NAVY BUTTER

In 1902, the Navy Department called upon USDA for assistance in obtaining good quality butter which could be transported to sea without serious deterioration, or stored for extended period of time (96, 1902, p. 44). The Navy Department found it expedient to procure and store a year's supply of butter during the period of heavy production. That was before there was any knowledge of sweet cream butter. The requirements of the Navy were merely that the butter score at least 93 points.

The first investigations were to determine the effect of acid content on the keeping quality of butter. Experiments were conducted along this line, covering a period of several years, and the results showed conclusively that butter made from pasteurized low acid cream kept for much longer periods in storage without developing the characteristic storage flavor associated with ripened or sour cream butter.

The Dairy Division developed procurement specifications for the Navy Butter program. Sweet cream butter making was developed by C.E. Gray and L.A. Rogers, Dairy Division, BAI, for the Navy in 1906 (97, 1906, p. 162). The specifications required Government inspection of the following: ingredients, manufacture, sanitation, packing, boxing, marking, end product and shipping. The butter had to be 93 to 95 score and its moisture content was not to exceed 13 percent.

The volume acquired by the Navy under this special sweet-cream butter program showed a steady decline after World War I. In 1929, the last year of the program, the Navy purchased only 147,000 pounds at three creameries (99, 1929, p. 21).

MARKET INSPECTION OF BUTTER

A study of market conditions regarding the sale of butter in the early part of this century convinced the officers of the Dairy Division, that something should be done to assist butter makers in producing a better quality of butter than seemed to be finding its way to the markets. The work done by the State dairy and food commissioners and their field men indicated very strongly that there was such a need. Inspectors would visit a creamery and perhaps find everything apparently in good order; they would see only the fresh butter. When this butter reached the markets some ten days or two weeks later, however, it was very often deficient in some respect.

In order to bridge the gap which seemed to exist between the factory inspection and the receipt of the butter on the market, an inspector of the Dairy Division was appointed in Apr. 1906, to examine the poor qualities of butter entering the New York market (97, 1906, p. 45). This work was undertaken as an experiment to determine if some assistance could be rendered to the creameries by giving them exact information on the condition and quality of their butter on its arrival in the market.

The work proved so advantageous that the butter board in Chicago requested the appointment of a similar inspector for that market, and this request was complied with. A system of reporting was organized whereby a statement of the condition and quality of the butter was sent to the butter maker, a copy filed with the butter dealer who purchased the butter, and another copy sent to the office of the dairy and food commissioner of the State in which the creamery was located, for the use of his field inspectors. The dairy and food departments, particularly in Michigan, Minnesota, and Iowa, indicated their desire to cooperate with the Federal Department of Agriculture in making this work a complete success.

The reports were not in the nature of fault-finding criticism; on the contrary, they were intended to help the butter maker produce a better product and obtain a better price. A limited number of chemical analyses were also made of the butter. The plan was for the inspectors to spend three weeks of each month in the city, and the remainder of the month in visiting the creameries that seemed to be having the most trouble with their product.

As this work progressed, more and more creameries took an interest in the program and availed themselves of the service. The commission men found that it was to their advantage to have a disinterested expert examine the butter and send a report to the creamery. While the service resulted in a general improvement of the quality of butter received on the market, many creameries were unable to improve the quality of their butter because the character of the cream they received was such that it was impossible for them to make a better grade of butter.

In 1908, a similar service was extended to the San Francisco market (97, 1908, p. 278). After a few years, interest in the inspection program seemed to wane and the Dairy Division discontinued the service on Nov. 1, 1912, (97, 1913, p. 79).

¹ 31 Stat. 926.

² 32 Stat. 193.

³ 60 Stat. 300.

⁴ 11 F.R. 14674.

⁵ Secretary's Memorandum 1320, Supp. 4, Nov. 2, 1953. Secretary's Records, USDA, National Archives.

⁶ Agricultural Research Service, Administrative Memorandum 101.1, Dec. 28, 1953. National Agricultural Library.

⁷ 31 F.R. 7916.

⁸ Office records. Available in Poultry and Dairy Quality Division, FSQS, USDA.

SOME BASIC PRINCIPLES OF QUALITY
EVALUATION OF DAIRY PRODUCTS

The quality evaluation of dairy products is made by organoleptic judgments and/or chemical and microbiological analyses. This section will deal only with the organoleptic examination of dairy products.

The subjective grading of dairy products is based largely upon science; however, the attainment of a high state of proficiency in organoleptic judgments may be considered as an art based upon scientific principles (59, p. 7). The purpose of this section is to treat some of the scientific aspects of organoleptic examination of dairy products in order to impart a greater understanding and appreciation of the applicable product evaluation of the inspection and grading program.

The acceptance of a food, provided it is in adequate supply at a reasonable price, depends largely on the impression that this food makes on the senses, especially those of taste, smell, sight, and feel. Flavor is one of the most important attributes of any food produced for human consumption. No matter how attractive the food may be in appearance, how expensively it may be packaged, or how nutritious its contents, if it does not suit the taste or eating quality desires of the consumer, future sales will be negligible.

In any event, flavor is such an important part of a food or beverage that it cannot be neglected with impunity by a producer, processor or distributor. As improved kinds of foods appear, and as improved processing, packaging and handling are developed, attention to flavor becomes increasingly important. Flavor is the voice of foods. Pleasing flavor improves the healthfulness of foods as well as the enjoyment of eating, making possible the adequate nourishment of the body and adding directly to the joy of living.

Flavor has been defined as that property of a food or beverage that makes it excite the senses of taste and smell. This definition is somewhat narrow, because factors other than taste and smell contribute directly to flavor (40, p. 273). Flavor involves simultaneous tasting and smelling, with the tasting done in the mouth and the smelling in the nose -- from vapors that come from the mouth by way of the back of the throat. However, the factor of tactile perception, especially any feeling of pungency, coolness, warmth, oiliness, greasiness, mealiness, or graininess, plays a role in quality evaluation.

PHYSIOLOGY OF TASTE AND SMELL AND ITS APPLICATION

The sense of taste operates through taste buds located on the underside, as well as on the upper side of the tongue. However, taste buds are by no means confined to the tongue, but are scattered through the oral cavity. The upper surface of the tongue is covered with papillae - little nipples some of which contain taste buds. Located in the taste buds of the tongue

are taste cells, which actually receive the sensation of taste. The most external area of the bud is the pore which communicates with the oral cavity. Within the pore region there are numerous fine, fingerlike cytoplasmic projections and dense extracellular material.

Taste buds have been examined by light and electron microscopy at the Taste and Smell Clinic at the National Institute of Health, Bethesda, Maryland. (The Taste and Smell Clinic at NIH ceased operations in the fall of 1975).

Until recently, investigators felt that salt was detected only by the taste buds located at the tip of the tongue--sweet in the middle, sour along the sides, and bitter in the back of the tongue. The research findings of Robert I. Henkin, a world authority on lingual function, do not support this long standing concept. His studies show that the primary tastes of sour and bitter are near the junction of the soft and hard palates in the roof of the mouth and that most of the buds for salt and sweet are on the tongue--although a few are elsewhere, particularly in the upper throat (50, p. 316).

The product sample being tasted should be manipulated about the mouth and rolled over the tongue to allow full contact or response with the taste receptors. Moisture in the mouth and nasal passages assists the development and transmission of flavor sensations. For full taste sensation, a substance must be soluble so that it can be carried quickly to the taste buds. Production of saliva is naturally stimulated by food in the mouth and it serves, along with other functions, as the transporter of the food flavors. The warmth of the mouth also tends to free the volatile aromas which enter the olfactory chamber.

While many people are partially smell-blind or taste-blind, comparatively few do not have a positive and forceful response to food flavor (38, p. 96). Those, of course, with lingual abnormalities or a biochemical deficiency would experience an impairment of taste perception.

The interval of time required to determine the flavor may be divided into three parts: (a) that required for the mechanics of tasting, (b) the reaction time to taste stimuli, and (c) the time required for making the judgments (60, p. 20). The reaction time to taste stimuli, however, is fixed by nature and cannot be altered appreciably. The reaction time is not identical for all the basic tastes of sweet, salt, sour, and bitter, but this time is relatively short. In judging milk, the mean overall time for tasting and passing judgment on samples ranges from about 9 to 24 seconds, depending upon the flavor encountered.

Some substances seem to condition the taste organs for keener perception; others render them less able to perceive delicate taste reactions. Sugar, for instance, has an inhibitory effect on tasting. It brings about so-called "taste-fatigue." Cream and cheese are other products which adversely affect the sensitivity of taste. These products, which are known to impair taste sensitivity over a prolonged period, fail to stimulate a profuse flow of saliva, which plays a most important role in conducting the savory substances

to and from the taste buds. Conversely, salt and acids stimulate a generous flow of saliva. This fact has some practical significance. Experienced graders know that sated sensory functions can be quickly revived by eating a bite of apple. The distinctive apple flavor (involving acetic acid) will quickly stimulate saliva production and "clean the mouth."

Some coaches and instructors found it helpful in training students to discriminate between flavors by having them judge a graduated series of basic taste solutions. Trout and Sharp (1937) found that the tasting of pure solutions of various concentrations revealed to the beginner some of the "signs" and thereby helped demonstrate the fundamental principles underlying taste judgments (81, p. 55). Such tasting of "known solutions" may reveal blind spots toward certain flavors.

Coulter (1942) used the following solutions effectively (60, p. 26).

Grams Per Liter of Water Solution

	Solution Number			
	1	2	3	4
Salt	0.68	1.36	2.04	2.74
Lactic acid	0.037	0.056	0.074	0.112
Sugar	2.736	5.47	8.21	10.94
Quinine	0.0016	0.0032	0.0064	0.0128

In preparing those solutions, Coulter made up the most concentrated solution (Solution No. 4) and from this solution dilutions for samples 1, 2, and 3 were made. If distilled water is not used to make up these solutions, the amount of reagent used may have to be varied to compensate for the hardness of the water.

The sense of smell, closely associated in the popular mind with taste, operates through nerve-ends in an inaccessible area, smaller than a postage stamp, high in the nasal cavity back of the eyes. Each time we swallow there is a pumping of air from the mouth and throat to the nose, a kind of internal sniffing. During chewing or mastication or drinking, any aroma present ascends into the nasal chamber, where it is detected by the sense of smell. Thus obstruction or disruption of the nasal passages from a cold, allergy, and the like, will seriously handicap the ability to detect and evaluate flavors. (Try tasting an onion while holding your nose!)

From the quantitative standpoint, tasting, according to Crocker, is a "milligram" sense, whereas smelling often involves a millionths of a gram or less (40, p. 275). Odors reach the nerve-ends of the smelling area of the nose in vapor form greatly diluted by a mass of air.

While many investigators feel that smell is conveyed to the brain by only a limited number of components, there is no good agreement as to how many there are or what they may be. Various systems of odor classification have been devised, including the one by Crocker and Henderson. This system,

which was based on comparison of the odor sensations given by some hundreds of substances, postulates that there are only four kinds of smell nerves corresponding to: fragrant, acid, burnt, and caprylic. Recently there has been some noteworthy research into the nature of odors through the science of gas chromatography. Certain odors have been "fingerprinted" through complex photographic procedures; this has caused speculation about the development of "smelling machines" to grade products in the future. The complexity of mechanizing this art has thus far stymied such applications and it seems likely that the human nose, attached to a trained and experienced grader, will retain its usefulness in discerning food quality.

In flavor evaluation, the first impressions are gained through smelling. The odor is frequently the means for classifying or rough-judging the sample. Then the taste, in its broader sense involving all that is done in the mouth and oral cavity, is used for the final judgment, which is usually a confirmation of the smelling impression. However, tasting is important in its own right aside from smelling, because some flavors cannot be smelled. Examples are flat, salty, sweet, and bitter.

The art of tasting is one of learning how to concentrate on the indications of palate and nose, and particularly of learning what to look for as the critical factor in any article with which one is working. Long and careful training and a specialized education are required to attain the necessary proficiency in this kind of work. Also it is extremely helpful for the individual to possess a good retentive memory in making quality assessments.

The sense of sight is used to evaluate the quality of dairy products mainly by judging the intensity, uniformity, and irregularities of color; the nature of the body or texture of the product; the neatness and soundness of the exterior of the package; and the soundness of the product contact packaging material. The grader must exercise caution to make certain that the judgment of the senses of smell and taste are not unduly influenced by the sense of sight.

The sense of touch also plays a part in the grading of dairy products. To illustrate: the tongue and palate can register the peculiar feeling of mealy, gummy, or salvy butter. Likewise, they record the sandy condition of ice cream. Pressure between the teeth determines the presence of undissolved salt or of crystallized lactose. The fingers and ball of the thumb play an important role in examining the body of butter and cheese.

The sense of sound may be helpful in grading dairy products. An experienced judge can get an indication of the relative size and distribution of the "holes" or "eyes" in Swiss cheese by gently tapping the outside of the cheese with the fingers. Also, the relative amount of free water in leaky textured butter can be indicated by the "slushing" sound made when the trier plug is reinserted into the hole from which it was drawn.

It should be recognized that there are variations in individual taste sensitivity. Threshold values vary with individuals - some individuals have lower threshold values than others (53). Despite possible marked differences in sensitivity, a person with normal senses of taste and smell and with proper training, may become by diligent effort a proficient grader of dairy products. It is in large measure a matter of perception, a knowledge of what signs to look for, and of the way to interpret these signs.

REGULATIONS GOVERNING THE INSPECTION AND GRADING
OF DAIRY PRODUCTS AND RELATED MATTERS

As previously reported, regulations governing the grading of butter were first issued in Service and Regulatory Announcements No. 51 (Bureau of Markets), May 28, 1919. Modifications of these regulations were made in 1925, and expanded to include the inspection and certification of cheese and eggs.

RULES AND REGULATIONS (1925-1932)

On Sept. 14, 1925, the Secretary of Agriculture prescribed and promulgated rules and regulations governing the inspection and certification of butter, cheese, and eggs, effective after 1925 (91). They provided for inspections to be performed wherever these products were offered for interstate shipment. This included farms, factories, warehouses, loading platforms, wagons, trucks, railway cars, boats, vessels, and other places where these products were handled, kept or stored. The designated inspection markets were Boston, New York, Philadelphia, Chicago, Duluth, St. Paul, Minneapolis, San Francisco, and Washington, D.C.

The fees for the grading of butter were based on the number of churning in the lot at the rate of \$1.00 for seven churning or less and 10 cents for each additional churning; or on a poundage basis, when the butter packages were not marked with the churning numbers, ranging from \$1.00 for 1,500 pounds or less, to \$2.50 for up to 10,000 pounds, and 50 cents for each additional 10,000 pounds or fraction thereof.

Inspection fees for the grading of cheese were based on factory vat numbers, at the rate of \$1.00 for 7 vats or less and 10 cents for each additional vat; or on a poundage basis, when each separate factory vat number was not marked on the packages, ranging from \$1.00 for 25 packages or less, to \$2.50 for up to 200 packages, and 50 cents for each additional 100 packages or fraction thereof.

Provision was made to charge for the inspection on a time basis, when the unit, poundage or package charge was insufficient to cover the inspection cost, at the rate of \$2.00 per hour.

An additional fee of \$3.00 was assessed when the inspection was made in a freight car, or in other places where the entire lot of the product was not readily accessible to the inspector.

Fees for reinspection were three times those for original inspections, except that no fee was charged when there was evidence that the original grading was in error.

A provision added to the regulations specified that any willful misrepresentation or any deceptive or fraudulent practice made or committed by an applicant for inspection or reinspection in connection with the making or filing of an application or the use of an inspection or reinspection certificate or a certificate of quality issued by an inspector would be deemed sufficient cause for debarring such person from any further benefits of the act. And in case of violations of the Food and Drugs Act of June 30, 1906, the shipper might be subject to prosecution and the butter or cheese to seizure.

On Dec. 24, 1925, the Chief of the Bureau of Agricultural Economics, issued related instructions governing the stamping, labeling, and certification of butter, cheese, and eggs, effective Apr. 15, 1926 (89). These instructions authorized the use of "certificates of quality" in merchandising butter, cheese and eggs, of a specified grade which had been officially graded.

Authority to issue certificates of quality was given only to those who made application for the privilege and who declared their intentions and willingness to conform to the letter and spirit of the instructions, and who agreed to provide the certificates of quality without cost to the Government and to keep records of their use and furnish such information upon request.

Improper, unethical, fraudulent, illegal, or unauthorized use of the certificates of quality was deemed sufficient cause to deny further privilege or authority to use certificates of quality.

The instructions also provided that official inspectors use the standards and grades prescribed in the following publications when grading butter and cheese:

Butter: Service and Regulatory Announcements No. 51 (Agricultural Economics) entitled "Rules and Regulations for the Inspection of Butter ..."

Cheese: Office of Secretary Circular No. 157 entitled "Handbook for the Inspection of Whole-Milk American Cheese ..."

On Apr. 28, 1927, the Secretary of Agriculture promulgated revised rules and regulations governing the grading and certification of butter, cheese, and eggs, effective July 1, 1927 (92). They were revised to the extent that the term "reinspection" was changed to "regrading," and the schedule of inspection fees was increased.

In the case of butter, the grading fee was increased to \$1.50 for 7 churning or less, and 15 cents for each additional churning; when each churning was not indicated by number or otherwise on the packages, the fee on the poundage basis ranged from \$1.50 for 1,500 pounds or less, to \$3.75 for up to 10,000 pounds, and 75 cents for each additional 10,000 pounds or fraction thereof beyond 10,000 pounds.

In the case of cheese, the grading fee was increased to \$1.50 for 7 vats or less and 15 cents for each additional vat; and when each separate factory

vat number was not indicated by number or otherwise on the packages, the fee on the package basis ranged from \$1.50 for 25 packages or less, to \$3.75 for up to 200 packages, and 75 cents for each additional 100 packages or fraction thereof. The inspection rate of \$2.00 per hour remained unchanged for butter and cheese.

On Sept. 13, 1932, the Secretary of Agriculture promulgated rules and regulations governing the grading and certification of butter, cheese, eggs, dressed poultry, and dressed domestic rabbits, effective Sept. 15, 1932 (93). They superseded Service and Regulatory Announcements No. 96 and its supplement. The designated inspection markets for dairy products were Boston, New York, Philadelphia, Chicago, Duluth, Minneapolis, San Francisco, Los Angeles, Portland, Seattle, and Washington, D.C.

The provision for "regrading" was changed to "appeal grading"; application for this service was required within 24 hours of the original grading and the identity of the product on which the appeal grading was to be made had to remain intact. The fee for inspecting butter and cheese was based on the number of churning of butter or vats of cheese, or the net weight in each lot. The inspection fee for seven or less churning or vats was \$1.50 and 15 cents for each additional churning or vat; when each separate churning or vat was not indicated by number or otherwise on the packages the fee ranged from \$1.50 for 1,500 pounds or less to \$3.75 for up to 10,000 pounds or fraction thereof. The hourly rate remained the same, \$2.00.

Regulations Under the "Farm Products Inspection Act" (1942)¹

Revised rules and regulations governing the sampling, grading, grade labeling, and supervision of packaging of butter, cheese, eggs, poultry, and dressed domestic rabbits, under the "Farm Products Inspection Act," were published in the Federal Register, July 23, 1941, to be effective Oct. 1, 1941.² They superseded the rules and regulations which had been in effect since 1932. The designated inspection markets remained the same, except that St. Louis was added.

Provision was made for the licensing of official samplers to take and ship samples of dairy products to USDA grading offices for official grading. This type of service was used, particularly on butter, during the late 1930's and early 1940's. Also, provision was made for the service of a supervisor of packaging in connection with product packaged under certificates of quality or grade labels.

The regulations required the applicant to make the products for sampling and grading accessible and to be placed so as to disclose their quality and condition. Also, samples of products drawn for examination were to be graded only under conditions that would permit a true and correct determination of their class, quality, or condition. Gradings requested to determine the class, quality, or condition of products which had been previously graded were considered regradings, unless the applicant questioned the correctness of the last certificate issued on the product.

When each separate churning or vat was indicated by number or otherwise on the packages, a fee of \$1.50 was charged for 5 or less churnings or vats and 20 cents for each additional churning or vat in the lot. For a lot of 18,000 pounds or more, the minimum charge was \$4.00. The super-size churns with a capacity of 2,000 pounds were made available to the butter industry. The normal weight of a carlot of butter was 18,900 to 19,200 pounds, containing about 20 churnings made with the conventional size churns (one-thousand pound capacity). With the super-size churns, the average carlot contained only about 10 to 12 churnings; to place the inspection fee on an equitable basis, the minimum fee for an 18,000 pound carlot was established.

When each separate churning or vat was not indicated by number or otherwise on the packages, the inspection fee ranged from \$1.00 for 500 pounds or less to \$3.75 for up to 10,000 pounds, and 75 cents for each additional 10,000 pounds or fraction thereof.

The fee for official sampling, and official supervision of packaging, was at the rate of \$1.00 per hour and the fee for official grading was \$2.00 per hour, in lieu of the poundage basis or the number of churnings of butter or vats of cheese in the lot. Fees for appeal gradings were double those for original gradings, except that no fee was charged when there was a material error in the certificate from which the appeal was taken. Appeal gradings for Government agencies were made at actual cost (same as original grading). An additional fee of \$3.00 was charged when the sampling or grading was made in a freight or express car or other place where the entire lot of product was not readily accessible to the official sampler or official grader.

Authority to use certificates of quality was granted only to applicants who provided for the printing and packaging of the butter to be performed under the supervision of an official supervisor of packaging. The supervisor of packaging had custody of all supplies of packaging materials including all certificates of quality used in the packaging of officially graded products in the plant in which he was assigned. The supervisor of packaging was required to maintain a complete and detailed record of all new supplies of materials received and the supplies used in the packaging of officially graded product, in accordance with official instructions. Each packager of certified butter was required to maintain the packaging room in a clean and sanitary manner, in accordance with official specifications.

Each applicant for the privilege of issuing certificates of quality or for the packaging of butter under certificates of quality was required to maintain a keeping-quality cabinet of suitable construction and condition. The samples of butter were incubated for 7 days at 70°F., after which they were examined by an official grader to determine the keeping quality of the butter. In many cases a preliminary examination was made after 72 hours. Butter of known poor keeping quality was not eligible for packaging with certificates of quality. The officially graded butter, to be packaged with certificates of quality, had to be cut and wrapped within 7 days from the date of grading. The accelerated keeping-quality test was instituted on a trial basis in the summer of 1936 by Edward Small and officially inaugurated 2 years later.³

All official samplers, graders, and supervisors of packaging, authorized by appointment or license to issue sampling or grading certificates or certificates of packaging were forbidden during the period of that appointment or license to take active part in political management or in political campaigns. Willful violation of this prohibition constituted ground for dismissal in the case of appointees and revocation of license in the case of licensee.

Any willful misrepresentation, unethical, deceptive, fraudulent, illegal, or unauthorized use of the inspection or grading service in any form by any person was deemed sufficient cause for debarment from any further benefits of the "Farm Products Inspection Act." This came after an opportunity for a hearing had been accorded and the person found guilty. Pending investigation and hearing, the Chief of the Service could, without hearing, direct that such person be denied the benefits of the act.

A notice was published in the Federal Register, Oct. 3, 1941, advising that the effective date of the above regulations was changed from Oct. 1, 1941, to Jan. 2, 1942.⁴

A set of instructions issued by the Chief of the Agricultural Marketing Service, was appended to the above regulations. The instructions dealt with six specific aspects of sampling, grading, and packaging of officially graded products. Of particular significance was the section relating to butter possessing satisfactory keeping quality. This required that the butter intended for packaging with certificates of quality be free from objectionable flavors as evidenced by the examination of official samples that had been subjected to the accelerated keeping-quality test.

The section dealing with "basis for charges" was amended and became effective as of the date published in the Federal Register, Oct. 1, 1942.⁵ The amendment provided for fees for sampling and supervision of packaging, to be based upon the actual time required to render the service, including the time required for travel between the office or point of previous duty and the place of service, at the rate of \$2.00 per hour. The previous rate was \$1.00 per hour. An additional fee of \$3.00 was charged when additional time was required in sampling or grading because the service was performed in a freight or express car or other place where the entire lot of product was not readily accessible.

MODIFIED REGULATIONS UNDER THE "FARM PRODUCTS INSPECTION ACT" (1946)

The rules and regulations published in the Federal Register, July 23, 1946, were basically the same as those in effect in 1942, with some modifications.⁶ Graders or inspectors were not permitted to sign a certificate covering any product not graded or inspected by them. Applications for appeal gradings were required to be made within 2 days following the day of the original grading. Whenever practical, appeal gradings were conducted jointly by two graders, neither one of whom was involved in the grading being appealed.

The inspection fees for grading butter and cheese were increased. When each separate churning or vat was indicated by number or otherwise on the package, a fee of \$2.00 was charged for five or less churnings or vats and 30 cents for each additional churning or vat. For a lot of 18,000 pounds or more, the minimum charge was \$6.00. When the packages of butter or cheese were not identified by churning or vat number, the fee was based on poundage and ranged from \$1.50 for 500 pounds or less, to \$10.00 for up to 20,000 pounds, and \$2.00 for each additional 10,000 pounds or fraction thereof.

A schedule of sampling fees was established for dry milk and evaporated milk. For dry milk, a fee of \$1.75 was charged for any lot containing 1,500 pounds or less, and ranging up to \$4.00 for 10,000 pounds, and \$2.00 for each additional 10,000 pounds. For evaporated milk, a fee of \$1.75 was charged for 50 packages or less, ranging up to \$4.00 for 600 packages, and \$1.00 for each additional 500 packages in the lot. When it was more equitable to base the fee on time, the hourly rate was established at \$3.00. When the inspection, grading, or sampling service was performed in a freight or express car, a fee of \$4.00 was charged, in addition to the applicable rates specified.

Fees for laboratory analysis were published for the first time. The schedule of fees pertained to dry milk, evaporated milk, sweetened condensed milk, bulk cheese, process cheese, Carter's spread, butter, and butteroil.

REGULATIONS GOVERNING THE GRADING OF DAIRY AND POULTRY PRODUCTS (1949)

Amended rules and regulations were published in the Federal Register Mar. 30, 1949, under proposed rule making,⁷ and in final form, June 24, effective July 24, 1949.⁸

The term "product(s)" was redefined to mean butter, cheese (whether natural or process), milk, cream, and milk products (whether dried, evaporated, or condensed). The term also included any food product prepared or manufactured from any product if such product constituted at least 50 percent, by weight, of all the ingredients used in the preparation or manufacture of such food product. The term "National Supervisor" was used for the first time, to mean the Chief of the Dairy Products Section, Dairy and Poultry Inspection and Grading Division of the Dairy Branch, Production and Marketing Administration. This was consistent with the express authority for supervision of the grading service to maximize the degree of uniformity, on a national basis. The term "Official Plant" was used for the first time, to mean any plant in which the facilities and methods of operation had been found by USDA to be suitable and adequate for grading service. The amendment specified the reasons for the rejection of an application for sampling or grading service. Provision was made for a supervisor to regrade a product when there was evidence that the grader incorrectly graded the product. In all cases of a regrading, a regrading certificate was issued to supersede the original grading certificate. A schedule of laboratory fees for analyzing dry whey was added to the list of other dairy products. In the case of bulk cheese the fee for a complete moisture test in duplicate was increased to \$4.00.

REVISED GRADING REGULATIONS (1951-1965)

The Dairy and Poultry Inspection and Grading Division became two separate entities, effective July 1, 1951, necessitating the issuance of separate and revised rules and regulations. Those applicable to dairy products were published in the Federal Register, June 5, 1951, under proposed rule making,⁹ and in final form July 4, effective July 1, 1951.¹⁰

The revised rules and regulations included some additions and changes in the fee schedule. When the packages in any given lot of butter or Cheddar cheese were not identified by churning or vat number, the fee ranged from \$1.80 for 500 pounds or less, to \$10.50 for up to 20,000 pounds, and \$2.50 for each additional 10,000 pounds or fraction thereof. When all the packages in any given lot of butter or Cheddar cheese were individually identified by churning or vat number and the lot weighed at least 18,000 pounds, the minimum charge was \$6.00.

For the first time a schedule of fees was established for grading Swiss cheese. A fee of \$2.00 was charged for grading 5 wheels or less (identified by kettles) and 20 cents for each additional wheel. When the regular fee schedule was inadequate to compensate for the inspection, or sampling or supervision of packaging service, the charge was based on time at the rate of \$3.60 per hour.

The fee for the grading of each lot of samples of any product was based on the actual time required to perform the service, at a rate of \$3.60 per hour with a minimum charge of \$1.80 for each such lot of samples. If the applicant requested that grading service be performed on a holiday, he was charged double the rate otherwise applicable, and on a non-workday at a rate one and one-half times the normal rate. In the case of dry milks, provision was made for the examination of "scorched particles" instead of sediment. Also, the whey-protein test was added to the list of analyses. In addition, provision was made for the bacteriological analyses and other specified determinations with respect to individual tests for one factor.

Because of increased operating costs, the Inspection and Grading Branch, Dairy Division, PMA, amended the schedule of fees and charges for the grading of butter and cheese, sampling of milk, and the laboratory analyses of dairy products in the March 22, 1952, Federal Register with an effective date of Apr. 1, 1952.¹¹

When the packages in any given lot of butter, Cheddar cheese, or Swiss cheese were not individually identified, the fees ranged from \$1.80 for 300 pounds or less, to \$10.50 for up to 20,000 pounds, and \$2.50 for each additional 10,000 pounds. When all the packages in any given lot were individually identified by churning or vat number, a fee of \$2.70 was charged for 3 or less churnings or vats and 40 cents for each additional churning or vat. For any lot of butter or Cheddar cheese weighing 18,000 to 25,000 pounds, the minimum charge was \$8.00; in excess of 25,000 pounds, the minimum charge was \$10.00. When all the wheels of Swiss cheese were individually identified by kettle, a fee of \$2.70 was charged for 3 or less wheels and 25 cents for each additional wheel.

The fee for sampling dry milk ranged from \$2.70 for 1,500 pounds or less to \$6.00 for up to 10,000 pounds and \$2.00 for each additional 10,000 pounds or fraction thereof. The fee for sampling evaporated milk ranged from \$2.70 for 50 packages or less to \$6.00 for up to 600 packages and \$2.00 for each additional 600 packages or fraction thereof.

Slight adjustments were made in the fees for laboratory analyses. Some additional tests were provided: viscosity, for sweetened condensed milk; mold mycelia for butter; iron and copper, for dry milks; and lactose for milk sugar.

The regulations were again amended in the Federal Register, June 14, 1955, under proposed rule making,¹² and published in final form Aug. 5, 1955, effective Sept. 4, 1955.¹³ The term "area supervisor" was defined to mean any employee of the Department in charge of dairy grading and inspection service in a designated geographical area. The applicant was declared entirely responsible for furnishing sample packages that were truly representative of the class, quality, quantity, and condition of the lot and each unit thereof. When indications showed that the samples furnished were not truly representative, additional samples were required for verification.

Any manufacturing or processing plant that supplied products, directly or indirectly, for packaging with official identification was subject to survey and inspection. The products were not eligible for grading and official identification if processed in a plant under unsanitary or otherwise unsatisfactory operating conditions. The word "continuous" was discontinued in the USDA quality control service program. The time limit for packaging graded butter, natural cheese or dry milk solids with grade or other official identification was modified. Officially graded butter had to be packaged within 10 days and any lot of natural cheese or dry milk solids within 30 days, provided the product was properly stored during those periods. If the product was moved to another location, a regrading was required.

Inspection or grade marks permitted to be used to officially identify packages containing dairy products which were inspected or graded were contained in a shield form of four different designs: (1) for graded products under USDA inspection, for example, U.S. Grade AA butter packed under inspection of the U.S. Department of Agriculture; (2) for U.S. Grade AA butter manufactured in a plant using USDA resident grading and quality control service; (3) for U.S. Extra Grade dry milk solids manufactured in a plant using USDA resident grading and quality control service; and (4) for inspected products (when U.S. standards for grades were not established) processed and packed under USDA quality control service, such as pasteurized process cheese and related products.

Labeling and official identification was limited to U.S. Grade B or higher, or to an equivalent standard of quality for U.S. name grades or numerical score grades, or when U.S. standards for grades of a product had not been established.

The regulation pertaining to "debarment of service" was expanded substantially for clarification purposes. The following are some of the acts or practices deemed sufficient as causes for debarment: (1) any willful misrepresentation or deceptive or fraudulent practice in connection with the use of the terms, "United States," or "U.S.," "Officially graded," "Officially inspected," "Federal-State graded," or "Government graded," or terms of similar import in the labeling or advertising of any product without stating in conjunction therewith the official U.S. grade of the product; (2) the use of a facsimile form which violates in whole or in part any official identification for the purpose of purporting to evidence the U.S. grade of any product or the unauthorized use of a facsimile form which simulates in whole or in part any official grading or inspection certificate, stamp, label, or other identification for the purpose of purporting to evidence a grade or other official inspection mark; and (3) any interference with or obstruction of any grader, inspector, or sampler in the performance of his duties by intimidation, threat, bribery, assault, or any other improper means.

An amendment published in the Federal Register, Dec. 9, 1955, under proposed rule making,¹⁴ and in final form Feb. 1, effective Mar. 2, 1956,¹⁵ implemented Public Law 272, approved Aug. 9, 1955, amending the Agricultural Marketing Act of 1946. In substance, criminal penalties were provided for forgery or alteration of inspection certificates, unauthorized use of official grade marks or designations, and false or deceptive reference to United States grade standards or services.

Specific fees for additional laboratory tests were provided, and a slight reduction made in fees for certain tests. In addition, several other changes were made; for example, the section relating to "debarment of service" of any person was amplified by including any agents, officers, subsidiaries, or affiliates of such person.

A proposed amendment published in the Federal Register, Feb. 5, 1957,¹⁶ and in final form Mar. 1, effective Apr. 1, 1957¹⁷ provided for a slight reduction in fees for certain laboratory tests, and set forth fees for certain laboratory tests not previously included in the regulations. For example, the direct microscopic clump count, and a schedule of fees for the testing of ice cream and fluid milk was provided.

Another amendment published in the Federal Register, Aug. 14, 1957, under proposed rule making,¹⁸ and in final form Aug. 31, effective Oct. 1, 1957,¹⁹ clarified the meaning of the wording in the section on "grading certificates issuance" by specifying that lots of miscellaneous dairy products comprising more than one kind of product could be covered by a single grading certificate.

The amendment also included changes in the fee schedule for grading service. When all the packages in any given lot of butter and Cheddar cheese were individually identified by churning or vat numbers, a fee of \$2.70 was charged for 3 or less churnings or vats (total weight less than 18,000 pounds), and 40 cents for each additional churning or vat. For any lot of

butter or Cheddar cheese weighing 18,000 to 25,000 pounds, a minimum charge of \$8.00 was made and a minimum charge of \$10.00 for any lot in excess of 25,000 pounds. When all the packages in any given lot were not individually identified by churning or vat number, a fee of \$1.80 was charged for 300 pounds or less, ranging to \$10.50 for up to 20,000 pounds and \$2.50 for each additional 10,000 pounds or fraction thereof. When all the wheels of Swiss cheese were individually identified by kettle of Swiss cheese, a fee of \$2.70 was charged for three or less wheels and 25 cents for each additional wheel. Fees for grading lots of miscellaneous dairy products covered by a single grading certificate were based on the actual time required to perform the service, at the rate of \$3.60 per hour, with a minimum charge of \$1.80.

An amendment published in the Federal Register, June 19, 1959, effective July 1, 1959,²⁰ clarified the meaning of the wording in certain sections and increased the charges for inspection and grading services. The increases in charges were necessary by virtue of the 1958 legislation which raised the salary of Federal employees and because of job reclassification directed by the U.S. Civil Service Commission. When the charges for inspection, grading, sampling, or supervision of packaging service, based on units, were inadequate to reimburse the Service, the fees for performing such service were based on the actual time required, including travel time.

When the grading service was performed on a holiday, or a non-work day, or at a time other than during the grader's normal working hours, the charge for such service was assessed at a rate of one and one-half times the applicable rate had the service been performed during the grader's normal working hours. Fees for the grading of each lot of samples of any product were based on the actual time required to perform the service at the rate of \$5.00 per hour, with a minimum charge of \$2.50 for each lot of samples. When all the bulk packages in a lot were individually identified by churning of butter or vat of cheese, a fee of \$3.00 was charged for grading of three or less churnings or vats (total marked net weight less than 15,000 pounds), and 45 cents for each additional churning or vat. A minimum charge of \$9.00 was made for any lot of butter or Cheddar cheese weighing 15,000 to 20,000 pounds, plus a charge of \$2.00 for each additional 5,000 pounds or fraction thereof in excess of 20,000 pounds. For bulk packages of butter or Cheddar cheese not individually identified by churning or vat a fee of \$2.50 was charged for 300 pounds or less and \$11.50 for up to 20,000 pounds, plus \$2.00 for each additional 5,000 pounds or fraction thereof in excess of 20,000 pounds. Fees for grading lots of miscellaneous dairy products including small lots of more than one type of product covered by a single grading certificate were based on the actual time required to perform the service at the rate of \$5.00 per hour, with a minimum charge of \$2.50. For each sampling of any lot of dry milk, based on marked net weight the fees charged were \$3.75 for 3,000 pounds or less and \$6.50 for up to 10,000 pounds and \$2.25 for each additional 10,000 pounds, or fraction thereof, in excess of 10,000 pounds. For each lot of evaporated or condensed milk the fees charged were \$3.75 for 200 packages or less and \$6.50 for up to 600 packages and \$2.25 for each additional 600 packages or fraction thereof, in excess of 600 packages.

A further amendment published in the Federal Register, July 31, 1959, effective Aug. 1, 1959,²¹ provided for a charge of \$2.00 for each 10,000 pounds or fraction thereof in excess of 20,000 pounds. This change allowed a wider application of unit fees in the weight ranges of normal carlots of butter and Cheddar cheese.

REGULATIONS GOVERNING THE INSPECTION AND GRADING OF DAIRY PRODUCTS (1966-1976)

Fees were again increased in 1966 through amended regulations published in the Federal Register, Jan. 22, 1966, under proposed rule making,²² and in final form Mar. 24, effective as of the same date.²³ The cost of providing service had increased because of higher salaries and other operating costs. Changes made in the fee schedule brought revenues more nearly in balance with the increased costs. Other changes were included in the amended regulations. The regulations defined "condition of container" and distinguished between resident and continuous nonresident inspection service. To help assure satisfactory keeping of products assigned a U.S. grade, a plant survey program had been developed in the early 1950's; and in 1963, plant inspection and approval, as a condition of official grading of products, was inaugurated. This was publicized by the issuance of the listing entitled, "Dairy Plants Surveyed and Approved for USDA Grading Service."

The regulations cited a number of conditions deemed sufficient to reject an application for inspection or grading service. Some of these were: (a) when the product was owned by, or located on the premises of a person who had been denied the benefits of the Agricultural Marketing Act of 1946; (b) when the product was produced from unwholesome raw material or was produced under unsanitary or otherwise unsatisfactory conditions; (c) when the product was of illegal composition or lacked satisfactory keeping quality; (d) when the product had been made in a plant which had not been surveyed and approved for inspection or grading service; and (e) when payment of fees had been delinquent for over 60 days.

The regulations no longer provided for fees to be based on the number of manufacturing units in a given lot, i.e., churnings of butter or vats of cheese, as one of the options for basing the charges. The fees for the inspection and grading of each lot of butter and cheese and for inspection, sampling and test weighing of each lot of dry milk were based on poundage. The fees ranged from \$3.00 for 400 pounds or less to \$7.00 for up to 10,000 pounds with \$2.25 for each additional 10,000 pounds or fraction thereof. The fees for inspecting and sampling each lot of evaporated or condensed milk were based on case quantity. They ranged from \$5.00 for 200 cases or less to \$7.00 for up to 600 cases and \$2.25 for each additional 600 cases or fraction thereof. When the product containers were examined for compliance with "U.S. Standards for Condition of Food Containers" in conjunction with inspection or grading service, an additional charge of \$3.00 was made for each carlot examined. When samples of butter or cheese were test weighed in conjunction

with inspection or grading, an additional charge of 20 cents was made for each sample weighed. Inspection or grading service performed on a holiday or nonworkday, or at a time other than the grader's normal working hours, was charged at a rate of one and one-half times the normal rate. In the case of dry milks, provision was made for Vitamin A testing.

Charges for inspection related to condition of product, plant surveys, laboratory testing for pesticide residues, and other miscellaneous service were based on the time required to perform such service. In addition, traveling expenses and other charges were accounted for. Such charges included the costs of travel, per diem, and other expenses, plus a charge of 10 percent of the amount charged for said travel, per diem, and other expenses to cover administrative costs.

To cover increased costs due to legislation increasing salaries and other benefits paid to Federal employees and to bring that portion of the service covered by the hourly fee onto a self-sustaining basis, the hourly fee was changed from \$6.00 to \$7.20 in an amendment published in the Federal Register, Feb. 1, 1968, effective Mar. 1, 1968.²⁴

As a result of the third and final stage of the Federal Salary Act of 1967, salaries of Federal employees who performed dairy products inspection and grading services increased approximately 10 percent effective with the first pay period beginning on or after July 1, 1969. Accordingly, the hourly inspection rate was increased thereafter from \$7.20 to \$8.00 per hour. The amended fees were published in the Federal Register, June 26, 1969, effective July 1, 1969.²⁵

Other fee changes were made in 1970 in an amendment published in the Federal Register, Aug. 8, effective Sept. 1, 1970.²⁶ The hourly rate for inspection, grading and sampling service was increased from \$8.00 to \$9.00, with a minimum charge of one-half hour. In the case of dry milk and related products, tests for Salmonella, phosphatase and density were added to the routine tests. Laboratory analyses of corn-soya-milk were also added to the list of products analyzed by the laboratory. The laboratory fee, based on time, was increased from \$9.00 to \$11.00 per hour, with a minimum charge of one-half hour.

The inspection, grading and sampling fees increased again in 1971 with a notice of the amended fees published in the Federal Register, Feb. 12, effective Mar. 1.²⁷ The hourly rate was increased from \$9.00 to \$10.00 for service performed between 6 a.m. and 6 p.m., and \$11.00 for service performed between 6 p.m. and 6 a.m., calculated to the nearest 15 minute period. The regulations for the first time established all inspection or grading fees, except for resident programs, on an actual time-required basis.

In 1972, the regulations governing the inspection, grading and sampling of manufactured or processed dairy products were revised, particularly with reference to the fee schedule, and were published in the Federal Register, Feb. 26, effective Mar. 1.²⁸ The fees for inspection, grading and sampling were

made at the hourly rate of \$10.60 for service performed between 6 a.m. and 6 p.m., and \$11.60 for service performed between 6 p.m. and 6 a.m. The fees were arrived at by including the time required to perform the service, calculated to the nearest 15 minute period, and the time required for the preparation of the certificates and reports and applicable travel time of the inspector or grader. A minimum charge of one-half hour was made for service pursuant to each request or certificate issued. Charges for laboratory analysis were made at the hourly rate of \$11.60 for the time required to perform the service, with a minimum charge of one-half hour. Minimum rates based on average time required to perform the test specified applied unless the actual time required to perform the test was greater than the minimum set forth in the fee schedule.

Revised regulations published in the Federal Register, June 8, 1972, under proposed rule making,²⁹ and in final form Oct. 19, effective immediately³⁰ limited appeal inspection or grading when as a result of the original inspection the commodity was found to be contaminated with filthy, putrid and decomposed material.

Salary increases for Federal employees and other rising costs of maintaining the inspection and grading service made it necessary to increase the fees charged for inspection and grading service in order to recover more nearly the costs of performing the service in 1973. The amended fees were published in the Federal Register, Feb. 14, effective Feb. 18.³¹ Inspection, grading and sampling service was performed at the hourly rate of \$12.00 between the hours of 6 a.m. and 6 p.m., and \$13.20 for service performed between 6 p.m. and 6 a.m., calculated to the nearest 15 minute period. A minimum charge of one-half hour was made for service pursuant to each request or certificate issued. Charges for continuous nonresident service were made at the hourly rate of \$14.20 for services performed between 6 a.m. and 6 p.m., and \$15.40 for services performed between 6 p.m. and 6 a.m., for the number of hours each inspector or grader is assigned, including travel time at the beginning and end of the period. The costs of travel time were included in the hourly rate. The charge for holiday, Saturday, or Sunday work or overtime work (work in excess of each 8-hour shift Monday through Friday) was made at \$20.00 per hour. Fees for laboratory analysis were made at the hourly rate of \$13.00 for the time required to perform the service, with a minimum charge of one-half hour.

Fee increases in 1974 were published in the Federal Register, Jan. 4, effective Jan. 6.³² Charges were made for inspection, grading and sampling service at the hourly rate of \$13.20 for service performed between 6 a.m. and 6 p.m., and \$14.52 for service performed between 6 p.m. and 6 a.m., calculated to the nearest 15 minute period, including the time required for preparation of certificates and reports, and travel of the inspector or grader in connection with the performance of such service. A minimum charge of one-half hour was made for service pursuant to each request or certificate issued. Fees for continuous non-resident service were made at the hourly rate of \$15.60 for service performed between 6 a.m. and 6 p.m., and \$16.92 for services performed between 6 p.m. and 6 a.m., for the number of hours each inspector or grader was assigned, including travel time at beginning and end of each period. The costs of travel were included in this hourly rate. The charge for holiday, Saturday or Sunday work or overtime (work in excess of each eight-hour shift Monday through Friday) was assessed at \$22.20

per hour. Fees for laboratory analysis were made at the hourly rate of \$14.30 for the time required to perform the service, with a minimum charge of one-half hour.

Additional substantial fee increases were needed in 1974 to offset continuing spiraling overhead costs and salaries. A proposed schedule of fees was discussed with representatives of the dairy industry and dairy trade associations and published in the Federal Register, July 3, effective as of the same date.³³ Fees for inspection, grading and sampling service were increased to \$16.00 per hour for service performed between 6 a.m. and 6 p.m., and \$17.60 for service performed between 6 p.m. and 6 a.m., calculated to the nearest 15 minute period with a minimum charge of one-half hour. Charges for the inspector or grader in charge of a continuous resident program were made at the rate of \$12.00 per hour for services performed during the assigned tour of duty. Charges for the assistant inspector or grader were made at the rate of \$10.00 per hour for the assigned tour of duty. Charges for service performed in excess of the assigned tours of duty were made at a rate of 1 1/2 times the regular rates. Previously, the applicant for continuous resident inspection or grading service was assessed the salary of the inspector or grader, plus a stated administrative charge. Charges for continuous non-resident service were made at the hourly rate of \$18.60 for service performed between 6 a.m. and 6 p.m., and \$20.20 for service performed between 6 p.m. and 6 a.m., for the number of hours each inspector or grader was assigned. The charges for time required by each inspector or grader to travel to and from the processing plant at beginning and end of the period of continuous service was made at the hourly rate of \$18.60. Travel expenses were included in the hourly rate. The charge for holiday, Saturday or Sunday work or overtime was made at \$26.60 per hour. Fees for laboratory analysis were made at the hourly rate of \$18.00, with a minimum charge of one-half hour.

Fee increases in 1975 were published in the Federal Register, Oct. 30, effective Nov. 9.³⁴ Fees for inspection, grading and sampling service were increased to \$17.00 per hour for service performed between 6 a.m. and 6 p.m., and \$18.70 for service performed between 6 p.m. and 6 a.m., with a minimum charge of one-half hour. Charges for the inspector or grader in charge of a continuous resident program were made at the rate of \$13.00 per hour for services performed during the assigned tour of duty. Charges for the assistant inspector or grader were made at the rate of \$11.00 per hour. Charges for service performed in excess of the assigned tours of duty were made at a rate of 1 1/2 times the regular rates. Charges for continuous non-resident service were made at the hourly rate of \$21.20 for service performed between 6 a.m. and 6 p.m., and \$23.32 for service performed between 6 p.m. and 6 a.m., for the number of hours each inspector or grader was assigned, including travel time at beginning and end of the period. The costs of travel time were included in the hourly rate. The charge for holiday, Saturday or Sunday work or overtime (work in excess of each eight-hour shift, Monday through Friday) was made at \$29.70 per hour. Fees for laboratory analysis remained unchanged.

Fee increases in 1976 were published in the Federal Register, Nov. 4, effective Nov. 21.³⁵ A change in procedures allowed for the reduction of the administrative charge applied to the travel costs, reducing same from 25 percent to 10 percent. In the fall of 1976, salaries of Federal employees were increased and with increases in travel allowance and other costs incurred in providing inspection and grading service, it was necessary to increase fees charged for inspection and grading services to approximate costs of performing the service. For inspection, grading and sampling service the charge was assessed at \$18.20 for service performed between 6 a.m. and 6 p.m., and \$20.00 for service performed between 6 p.m. and 6 a.m., for the time required to perform the service calculated to the nearest 15 minute period, including the time required for preparation of certificates and reports, and travel of the inspector or grader in connection with the performance of the service. Charges for laboratory analysis were made at the hourly rate of \$19.30 for the time required to perform the service. A minimum charge of one-half hour was made for the service pursuant to each request or certificate issued. The minimum rates based on average time required to perform the test specified applied unless the actual time required to perform the test was greater than the minimum set forth in the fee schedule.

The rules and regulations governing the inspection and grading service of dairy products were developed by:

Roy C. Potts	-	1919-1942
Bennett J. Ommodt	-	1942-1946
Bennett J. Ommodt and Harold E. Meister	-	1946-1959
Harold E. Meister and William G. Bryan	-	1959-1966
Edwin F. Garbe and William G. Bryan	-	1966-1970
Edwin F. Garbe and Lynn G. Boerger	-	1970-1974
Edwin F. Garbe	-	1975 to present

WITHDRAWAL OF SERVICE

During 58 years of inspecting and grading dairy products, it had been necessary to withdraw or deny service to four companies for misuse of the service. The withdrawal of service ranged from 3 to 6 months. The violations consisted of packaging ungraded products with USDA grade labels, and switching samples for official laboratory testing that were not officially sampled. In addition, inspection or grading service had been withdrawn for failure to pay bills for service rendered or insanitary or unsatisfactory plant conditions.

The regulations governing the inspection and grading of manufactured or processed dairy products, starting in the 1920's, provided for notification of withdrawal of service to those found in willful violation of the regulations and the opportunity to have a "hearing" to show cause why the service should not be denied.

On May 3, 1966, the Consumer and Marketing Service, USDA, published "Rules of Practice Governing Withdrawal of Inspection and Grading Service Under the Agricultural Marketing Act of 1946."³⁶ These rules of practice

were published in part as a result of a willful violation of the inspection and grading service on a dairy product wherein the respondent was given a hearing which resulted in a withdrawal of service for switching nonfat dry milk samples, in the spring of 1966.

The rules of practice provide for a conditional withdrawal of service, which means the withdrawal, not involving disciplinary action, of grading or inspection service from a person for a correctable cause, such as failure to pay bills for service rendered or insanitary or unsatisfactory plant conditions.

They also provide for disciplinary withdrawal of service, which means the withdrawal of grading or inspection service for any reason (other than a conditional withdrawal) due to a violation of the act or the regulations issued thereunder. The term includes termination of service contracts for cause even though the contract may provide for the unilateral termination by the Consumer and Marketing Service under certain specified conditions.

In addition, the rules of practice provide for "Decision and order" which includes the Administrator's findings of fact; conclusions with respect to all material issues of fact and law as well as the reasons or basis therefor; and order.

The rules of practice do not modify existing procedures for refusing to inspect, grade, or certify a specific lot of product because of adulteration, improper preparation or improper presentation of the lot for grading, or because of failure to comply with any similar requirements set forth in applicable regulations.

The Director of the Dairy Division may withdraw grading or inspection service from a person for a correctable cause (conditional withdrawal service), and may restore service after appropriate corrective action is taken, in accordance with prescribed procedures.

In the case of "disciplinary withdrawal of service" the Division Director is required to transmit to the respondent a written notice (telegram or letter) which sets forth briefly the nature of the violation or violations, including allegations of fact which constitute a basis for the proceeding. The notice offers the respondent an opportunity to submit a specific written statement by way of answer and the right to request an oral hearing at which evidence may be presented in support of respondent's position. The notice also states the time within which answer by the respondent must be made.

All motions and requests are filed with the Administrator, except that if a hearing has been requested, the motions and requests of the respondent are filed with the Hearing Clerk, unless made during the course of an oral hearing, in which case they may be stated orally and made a part of the transcript. The Administrator rules on all motions and requests filed, except that if a hearing has been requested by respondent, the Hearing Officer is authorized to rule upon all motions and requests filed or made prior to the filing of his report, except motions to dismiss. The final decision rests solely with the Administrator of the Agricultural Marketing Service.

Several changes in the rules of practice, under which inspection and grading services may be withdrawn from applicants who request such services provided by the Agricultural Marketing Service, were published in the Federal Register, August 19, 1975, and effective that date.³⁷

The changes in these rules of practice are the result of court decisions which have raised questions about due process in administrative proceedings where the same agency both initiates withdrawal of service action, and makes the final decision with regard to disposition of the case. Consequently, these rules have been changed to provide for the issuance of initial decisions by an Administrative Law Judge rather than the Administrator. The decision of the Administrative Law Judge would become final unless appealed to the Secretary of Agriculture within 35 days.

Other changes were incorporated into this revision so as to achieve uniformity among various agencies of the Department in their respective rules of practice regarding withdrawal of service. For this reason and to insure the adequate protection of the legal rights of all parties, such things as the right to seek depositions, affidavits, oral arguments before the Secretary, appeals of decisions, and reopening of hearings or other proceedings were included in this revision.

Additional changes were made to provide further instructions regarding the authority and responsibility of Judges, and one section was added to reflect the authority of the Secretary to act in place of the Administrative Law Judge in any proceeding.

The section on definitions was changed to reflect terms currently contained in the rules of practice. The definition of conditional withdrawal was amended to more clearly reflect the Agency's right to withdraw service for interference with its employees in the performance of their duties.

MEMORANDA OF UNDERSTANDING BETWEEN THE FOOD AND DRUG ADMINISTRATION AND THE AGRICULTURAL MARKETING SERVICE

For more than 20 years there has been a working arrangement between the Food and Drug Administration and the U.S. Department of Agriculture concerning the inspection and standardization activities related to food products, including dairy products.

1953 Memorandum of Agreement

The first such working arrangement was set forth in a Memorandum of Agreement Between the Production and Marketing Administration and the Food and Drug Administration, effected May 29, 1953.³⁸

The Food and Drug Administration of the Department of Health, Education and Welfare is charged with the enforcement of the Federal Food, Drug and Cosmetic Act as amended. In fulfilling its responsibilities under the Act,

FDA's activities are directed toward the protection of the public health of the nation by insuring that foods are safe and wholesome, and that products are honestly and informatively labeled. This is accomplished by inspecting the processing and distribution of foods and examining samples thereof to assure compliance with the Act. FDA also promulgates under the Act, mandatory standards of identity, quality, and fill of container for food products after appropriate notices and hearings.

The Production and Marketing Administration of the U.S. Department of Agriculture, under the authority of the Agricultural Marketing Act of 1946, carried out certain voluntary service functions designed to aid in the efficient marketing of agricultural products. These included the development of commercial grade standards and specifications for foods and furnishing inspection and grading services, and issuing certificates of grade or quality and/or condition to producers, processors, shippers, buyers or other interested parties. The major purpose being to assist producers in preparing better quality of wholesome products for the betterment of all interested parties engaged in the marketing functions, for the public welfare.

Since the two agencies had certain common or related objectives in carrying out their respective regulatory and service functions it was believed desirable from the standpoint of public interest to document as effectively as possible the responsibilities of each agency relating to inspection and standardization activities for food products.

The major items of the 1953 Memorandum of Agreement pertained to the following:

The Production and Marketing Administration agreed to:

1. Furnish the Food and Drug Administration with a complete list of all food processing and packing plants utilizing PMA continuous inspection or grading service.
2. Decline to inspect or grade samples of products which had been seized by FDA, or which were known to have been involved in formal FDA actions.

The Food and Drug Administration agreed to:

1. Invite the PMA resident plant inspector to accompany the FDA inspector during his inspection of the plant and to discuss with the PMA inspector any conditions that appeared in violation of the Food, Drug and Cosmetic Act.
2. Notify PMA, Washington, D.C., in writing of the details of serious objectionable conditions wherever such conditions were found to exist in processing plants that offered products to PMA for inspection or grading; or when FDA believed such information would be of value to PMA in its inspection and grading activities.
3. Advise PMA immediately of all seizures by FDA of food products.

It was mutually agreed that:

1. Field offices of both agencies would maintain working relations with each other.

2. Proposed regulations by either agency establishing any type of standard would be referred to the other agency for review and comments prior to issuance, except amendments to PMA grade standards which did not modify any of the minimum quality factors contained in the standards previously referred to FDA for its review and recommendations.

1968 Memorandum of Agreement³⁹

In 1968, FDA and USDA recognized the need for exchange of information and coordination of activities in order to avoid duplication of efforts in the inspection and sampling coverage of dry milk plants.

An informal working agreement relating to salmonella surveillance was developed and became operative May 9, 1968. In that Agreement each agency signified its intentions as follows:

The Consumer and Marketing Service would:

1. Supply FDA copies of the semi-annual revisions of the publication "Dairy Plants Surveyed and Approved for USDA Grading Service."

2. Advise FDA of positive environmental samples whenever the positive tests were repetitive, report any positive product sample whether taken from the finished product or the processing line and report all results, both positive and negative, of follow-up tests on positive product samples.

3. Report any conclusions as to whether the positive product result was an isolated sample, or if not, whether the apparent source of contamination was detected and corrected.

4. Advise FDA of any plant whose manager failed to cooperate with C&MS in effecting salmonella control in the plant or products.

The Food and Drug Administration would:

1. Institute an independent in-plant check based on the foregoing C&MS reports of positive samples, if the C&MS report indicated that the salmonella source of problem had not been corrected.

2. Report to C&MS names and locations of plants whose product it found salmonella positive.

3. Report to C&MS, on request, data and results on its salmonella surveillance efforts on dry milk plants that were not approved under the C&MS program.

1970 Memorandum of Understanding⁴⁰

Under its resident grading and quality control service, USDA had established in 1967 a salmonella surveillance program on instant nonfat dry milk. FDA recognized the program as a sound control mechanism to protect the consumer from salmonella infection. To further reduce duplication of inspection, therefore, USDA and FDA concluded an agreement on salmonella surveillance of dry milk plants under USDA continuous inspection, in Nov. 1970.

The Agreement required that:

1. All of the plants production of dry milk products be tested for presence of salmonella.
2. Salmonella surveillance to include testing of environmental material.
3. Base nonfat dry milk for use in instant nonfat dry milk or other dry milk products to originate in a USDA approved plant and subject to salmonella surveillance.
4. Lots or product found salmonella positive or suspect to be stored separately and held under USDA control for repasteurization or other approved disposition.
5. All dry milk from plants under USDA full time inspection to be identified with a USDA shield.
6. FDA to accept the C&MS salmonella surveillance program on such plants and the finished dry milk products after shipment from those plants would not be sampled by FDA for salmonella examination. This did not preclude FDA sampling dry milk at manufacturing plants using dry milk as an ingredient, as a follow-up to consumer complaints, or where the dry milk may have become contaminated or adulterated after leaving the dry milk manufacturer's control.

1971 Memorandum of Understanding⁴¹

FDA and USDA concluded another Memorandum of Understanding in Dec. 1971, which updated and formalized the pertinent provision of the 1968 understanding with respect to routine salmonella inspection and sampling in dry milk plants approved for USDA inspection and grading, and operating under the USDA Quarterly Salmonella Surveillance Program. This understanding does not amend nor supersede the Memorandum of Understanding of Nov. 1970 covering Instant Nonfat Dry Milk plants operating under continuous USDA inspection.

Under the new agreement, C&MS would:

1. Supply FDA with copies of the quarterly revisions of the publication, "Dairy Plants Surveyed and Approved for USDA Grading Service."

2. Supply FDA with a list of dry milk plants using the USDA Salmonella Surveillance Program.

3. Report to FDA, by telephone, positive product samples when found in two or more production lots of finished products from plants engaged in commercial distribution. The telephone report to be followed by written confirmation.

4. Report to FDA any single positive product sample whether taken from the finished product or the processing line and follow-up test results on positive product samples.

5. Advise FDA of positive environmental samples whenever the positive tests are repetitive.

6. Advise FDA of any plant which fails to cooperate with C&MS in effecting Salmonella control in the plant or products.

FDA would:

1. Not institute plant inspections or in-plant sampling in any plant operating under USDA inspection and grading, or participating in the USDA Salmonella Surveillance Program except when C&MS reports positive samples on two or more production lots from plants engaged in commercial distribution.

2. Institute sampling of commercially distributed products when two or more production lots are identified with positive results, when such course was deemed advisable. FDA would not duplicate USDA efforts by resampling the same stocks at the same locations previously examined by USDA.

3. Report to C&MS names and locations of plants whose products were found Salmonella positive during course of market sampling.

4. Report to C&MS, on request, data and results on its salmonella surveillance of dry milk plants that were not approved under the C&MS program, or those in the USDA Salmonella Surveillance Program.

The designated liaison officers were:

Edwin F. Garbe
Consumer and Marketing Service
Dairy Division

Richard C. Swanson
Executive Director of Regional Operations
Food and Drug Administration

1973 Memorandum of Understanding

In order to assure the most effective possible discharge of their responsibilities, and that their activities be fully responsive to the public interest, the two agencies revised and reissued the Memorandum of

Agreement concerning inspection and grading of food products, which had been in effect between them since May 29, 1953. The revised agreement became effective Oct. 10, 1973.⁴²

The principal changes in the new agreement are as follows:

1. In addition to supplying the FDA with a list of plants operating under Agricultural Marketing Service resident type of inspection or grading contracts as had been done in the past, AMS in the future would immediately advise the appropriate field offices of FDA of those plants subject to withdrawal or suspension of service, termination of contract or denial of inspection service because of sanitation or other current good manufacturing practice deficiencies.

2. Whereas, historically, AMS had informed FDA of any information it had concerning products found to be hazardous to health, AMS in the future would report to the appropriate field offices information on any lot of product which, upon inspection, AMS declined to assign a grade (because of adulteration) unless such product was so reconditioned as to comply with FDA requirements and/or qualify for grade assignment, or was segregated and disposed of for non-food use or otherwise lawfully shipped or sold."

3. Both agencies would mutually exchange data and cooperate in the development of sampling plans, methodology and guidelines for determining natural and unavoidable defects common to products inspected and graded by AMS.

Other modifications of the agreement consisted largely of changing the point of exchange of information from Washington headquarters to the appropriate field office levels as a means of making cooperation between the two agencies more timely.

It was the intent of this action to make the AMS inspection service more valuable to both those who use it and to the public and confirmed the interests of AMS and FDA in providing assurance to the public that illegal or unwholesome products would not enter trade channels.

This Agreement does not apply to egg products, inspection of which is covered by the Egg Products Inspection Act, nor to grains, including rice, dry beans, peas or lentils which will be covered by a separate memorandum of agreement between the AMS and FDA.

The 1973 Memorandum of Agreement was published in the Federal Register on Oct. 10, 1973.⁴³

1975 Memorandum of Understanding⁴⁴

A new memorandum of understanding regarding salmonella inspection of dry milk product plants became effective Feb. 19, 1975. This memorandum updated and consolidated the 1970 and 1971 agreements in which FDA formally delegated to USDA the inspection of dry milk plants for salmonella.

The new agreement covers two kinds of AMS programs. One is the Plant Inspection Program (PIP) for approval for grading services, under which dry milk plants have been surveyed for approval every four months. Under PIP, there has been salmonella surveillance of the plant and its environment. Official inspection and grading of the product itself has been provided on request under PIP. Dry milk products produced under this program has not been eligible to be packaged with the USDA shield.

The other program covered by the memorandum is the Resident Inspection and Grading Program.

Under PIP, AMS pledged itself to:

- (a) Supply FDA with copies of the quarterly publication "Dairy Plants Surveyed and Approved for USDA Grading Service."
- (b) Promptly notify FDA in writing when a plant or a product from a plant was no longer under its Salmonella Surveillance Program or when a plant or product came under the program.
- (c) Report to FDA by telephone, confirm by written report, positive product samples on commercial production when quarterly surveillance revealed two or more product positive tests.
- (d) Report to FDA any single positive product sample.
- (e) Report all results, both positive and negative of follow-up tests on positive product samples.
- (f) Report positive environmental samples whenever the positive tests were repetitive.
- (g) Report any conclusion as to whether the positive product test result was an isolated finding, or if not, whether the apparent source of contamination was detected and corrected.

Under the PIP portion of the program, FDA pledged itself not to: "institute plant inspections for Salmonella in dry milk products in any plant operating under USDA inspection and grading, or participating in the USDA Salmonella Surveillance Program, except when AMS reports positive salmonella samples on two or more production lots from plants engaged in commercial distribution, or where routine sampling by FDA of lots in commercial distribution reveals positive salmonella findings."

The memorandum stated that this does not "preclude FDA inspections of any plant for problems other than salmonella, whether or not such plant produces dry milk products under USDA inspection or the Salmonella Surveillance Program, or the sampling of their products, including dry milk products, for problems other than salmonella."

FDA also pledged itself to:

(a) Institute sampling of commercially distributed dry milk products when two or more production lots were identified with positive results, when such course is deemed advisable. FDA would not duplicate USDA efforts by resampling the same stocks for Salmonella at the same location previously examined by USDA.

(b) Notify AMS regarding any information relating to plant or product noncompliance involving Salmonella. AMS would take necessary corrective action, and if necessary to achieve prompt correction, supplement its power with coordinated FDA authority and support.

(c) Report to AMS on request, data and results on its Salmonella Surveillance of dry milk plants that were not approved under the AMS program, or those in the USDA Salmonella Surveillance Program.

(d) If FDA determined that in interest of the public health it was necessary to take actions different from those set forth in this memorandum, it would give advance notice to AMS.

There were also obligations stated for plants and products under USDA's resident inspection program.

AMS would:

(a) Furnish to FDA the names and locations of plants operating under the program.

(b) Promptly notify FDA in writing when a plant was no longer under the program or when a plant comes under the program.

(c) Report Salmonella test results in accordance with the PIP portion of the memorandum of understanding.

FDA pledged itself to:

Accept the AMS Salmonella Surveillance Program on such plants and the finished dry milk products after shipment from those plants would not be sampled by FDA for Salmonella examination. This did not preclude FDA sampling dry milk at manufacturing plants using dry milk as an ingredient as a follow-up to consumer complaints, or where the dry milk might have become contaminated or adulterated after leaving the dry milk manufacturer's control. Neither would it preclude FDA inspections of any plant for problems other than Salmonella, whether or not such plant produces dry milk products under USDA inspection, or the sampling of their products, including dry milk products, for problems other than Salmonella.

The liaison officers have been the same officials designated in the 1971 memorandum of understanding.

The 1975 memorandum of understanding was published in the Federal Register,
March 3, 1975.⁴⁵

- 1 The Farm Products Inspection Act as used here is a popular name and is not
to be confused with the Farm Products Inspection Act of Mar. 3, 1927 to
prevent the destruction or dumping without good and sufficient cause, of
farm produce received in interstate commerce by commission merchants and
others.
- 2 6 F.R. 3622.
- 3 Letter from E. Small to Roy C. Potts, June 13, 1938, requesting official
approval of the introduction of the keeping-quality test for butter to be
packed with certificates of quality.
- 4 6 F.R. 5027.
- 5 7 F.R. 7768.
- 6 11 F.R. 7932.
- 7 14 F.R. 1411.
- 8 14 F.R. 3432.
- 9 16 F.R. 5280.
- 10 16 F.R. 6494.
- 11 17 F.R. 2475.
- 12 20 F.R. 4159.
- 13 20 F.R. 5622.
- 14 20 F.R. 9161.
- 15 21 F.R. 693.
- 16 22 F.R. 725.
- 17 22 F.R. 1287.
- 18 22 F.R. 6514.
- 19 22 F.R. 7011.
- 20 24 F.R. 4987.
- 21 24 F.R. 6153.
- 22 31 F.R. 903.
- 23 31 F.R. 4878.
- 24 33 F.R. 2432.
- 25 34 F.R. 9848.
- 26 35 F.R. 12639.
- 27 36 F.R. 2910

- ²⁸ 37 F.R. 4069.
- ²⁹ 37 F.R. 11476.
- ³⁰ 37 F.R. 22363.
- ³¹ 38 F.R. 4381.
- ³² 39 F.R. 986.
- ³³ 39 F.R. 24511.
- ³⁴ 40 F.R. 50455.
- ³⁵ 41 F.R. 48509.
- ³⁶ 31 F.R. 6570.
- ³⁷ 40 F.R. 36099.
- ³⁸ Memorandum of Agreement. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- ³⁹ Ibid.
- ⁴⁰ Ibid.
- ⁴¹ Ibid.
- ⁴² Ibid.
- ⁴³ 38 F.R. 27946.
- ⁴⁴ Memorandum of Understanding. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- ⁴⁵ 40 F.R. 8837.

METHODS AND CONDITIONS FOR THE INSPECTION AND
GRADING OF BUTTER, CHEDDAR CHEESE, AND NONFAT DRY MILK¹

Certain external conditions are common to the inspection and grading of butter and Cheddar cheese, but these have not always been fully realized. In the actual grading operation, the butter or cheese grader is sensitive to excessive noise, traffic, or other disturbing elements which would interfere with the inspection and grading of the product.

In the case of butter, at the outset of the inspection and grading service, requests for test weighing were somewhat spotty. Occasionally the shipper or receiver would request a test-weighing at the time of grading, or merely a test-weighing. However, test-weighing has always been a part of the transaction on sales to the Government and other contract deliveries. The inspection service at the grading stations and at the individual manufacturing plants likewise has always involved test-weighing of the product.

It is important that the temperature of the grading room or area not go below 60°F. If the grading room is too cold, the sense of smell is impaired, thus making it impossible for the grader to determine properly the actual aroma characteristic of the sample. Attention is paid to the adequacy of the lighting in the grading room, which generally means a minimum of 50-foot candles, to permit proper and accurate examination for grade and condition. The grader determines whether the atmosphere and surroundings are free from foreign odors; he does not permit smoking in the grading area.

BUTTER

Since the inception of the butter grading service in 1919, the facilities and conditions for grading at the dealers' warehouses, in many cases, at the central markets left much to be desired. Grading at the piers or docks in New York City, and in railroad cars on "team track" in Chicago, also had its problems. This was equally true throughout the country at some of the public cold storage warehouses, particularly in the secondary markets. In general, gradual progress was made in the availability of adequate facilities and conditions.

With chain stores and meat packers and others buying their butter needs direct from the creameries, and the establishment of State and regional cooperative butter-buying organizations at the point of production, the number of wholesale receivers in the central or primary markets decreased appreciably by the late 1930's. The 1920's saw over 100 wholesale receivers and jobbers in the New York market and almost as many in Chicago. By the 1960's only a few wholesale butter houses remained.

While the shift of assembling butter at central markets to production areas was taking place, requests for official resident butter grading service seemed to follow. Considerable attention was focused on the establishment of suitable grading rooms at the official grading stations; many of them were inaugurated in the 1920's and 1930's. This situation also referred to the individual manufacturing plants that applied for official resident butter grading and quality control service, starting in the late 1940's.

Inspection and Grading Equipment

The kind and character of butter-grading equipment and supplies have changed over the years. When the butter grading service was inaugurated in 1919, the graders used nickel-plated triers for grading bulk and print butter. These were largely replaced by chrome-plated triers in the 1930's, and stainless-steel triers in the 1940's. Starting in the 1960's, stainless-steel triers virtually replaced the plated triers. In the 1920's, wooden spatulas were used, and were changed, for the most part in the 1930's and 1940's, to metal or bone. In the 1950's, a plastic combination spatula-and-color rod was developed. Until the late 1940's, the Nafis color rod enclosed in a glass tube was part of the grader's equipment. The trier and spatula were cleaned between samples with a good grade of odor-free absorbent paper towels or tissues. In the late 1930's, sterile glass jars and paper containers, and in the 1960's, plastic containers, became a part of the grader's equipment in taking keeping-quality samples. Scales with at least quarter-pound graduations and sensitivity were used; these were approved and sealed by a city or State department of weights and measures, and test weights for checking accuracy of scales; also a supply of grading memorandums and official stamps for proper identification of the graded butter were used. Since the 1950's the graders have been supplied with a five-inch pointed metal stem dial thermometer.

Samples for Grading and Test-Weighing

When the inspection and grading service was instituted, some of the butter made by the batch method was not identified by churn numbers. Under the circumstances, the inspector selected at random 10 percent of the packages (tubs) in the lot for test-weighing and/or grading. When the butter was identified by churn numbers, the inspector selected one package from each churning.

Starting in the early 1940's, several of the butter manufacturers installed continuous churn systems; however, this method of manufacture did not take hold at that time. The system was improved in the mid-1960's, and ushered in a forward step in modernizing the manufacture of butter. To obtain a representative sample of butter made by the continuous churn system, it was necessary to select one sample package from each 5,000 pounds of production.

Before any butter is test-weighed, the scales are tested to determine whether or not they are in balance. They are tested at zero and at the range of test-weighing. For many years, the beam scale was used for test-weighing of butter, but by the mid-1940's, the dial scale became popular.

The packages to be weighed are stripped and the butter placed on a scale, including the liners. The test weight is read when the indicator comes to a rest (dial scale). Before recording the test weight, the grader makes a mental deduction for the weight of the liners. Investigation has shown that parchment liners (68 pound cubes) average about 3 ounces when dry or damp, and 4 ounces when wet. During the past 10 years, the grader has been furnished with standard tare weights for all common packaging. After the deduction has been made for the weight of the liners, the test weight is recorded only in terms of full pounds or of full pounds and quarter pounds. If the test weight does not fall on a full pound or full quarter pound, the net weight is recorded as the next lower quarter pound.

Grading Procedures²

Before the grader commences grading, he makes certain that the butter is in suitable condition. Starting in the mid-1930's, this meant that the temperature of the butter at the time of grading ranged from 45 to 55°F., with winter butter being graded at the higher temperature, and summer butter at the lower range. In general, the grader makes certain that the butter trier "pulls" readily, and that in returning the sample-plug to the bulk package, no difficulty is experienced in freeing the trier from the butter. If the temperature of the butter, or trier, or both, is abnormally high, stickiness or crumbliness may not be detected. The triers are kept at a temperature within the range of 60 to 70°F. The butter graders are keenly aware of conditions that could cause an erroneous product evaluation.

The normal properties of butter develop within a few days of manufacture. This applies to the characteristics of flavor as well as to the characteristics of workmanship. Butter which has not had a chance to "set" (too fresh, usually a day old) is extremely soft and may exhibit a sticky or ragged boring condition, which actually was not the cause of faulty workmanship. Generally, butter is not given an official grade until it is at least 48 hours old.

The grader must work with a thoroughly clean trier that is maintained in good condition at all times. When nickel and chrome-plated triers were used, they had a tendency to peel, and sometimes required replacing. Butter packed in a bulk package is examined with a large trier (12" or 15" blade, with opening 7/8" at the base and 5/8" at the tip) and the plug of butter drawn extends almost the full length of the trier.

Prior to the first grading operation, the grader observes the exterior of the butter looking for mold and surface defects, and the evenness of the liners. If the liner is parchment, the grader makes certain that it has had proper salt treatment. When butter was packed in wooden tubs (almost

nonexistent by the 1950's), they were paraffined and parchment-lined; parchment circles were placed on bottom and top, and the common practice of the buttermaker was to place a handful of salt on top before fastening the lid on the tub of butter. Corrugated and solid-fiber boxes, first used in the 1930's, virtually replaced the wooden tub (spruce and oak) by the 1950's. As a precaution against possible mold development, the Inspection and Grading Branch, Dairy Division, starting in 1951, required that the parchment-liners be immersed in a saturated brine solution and boiled for 30 minutes in a non-corrosive container, and the solution changed at least once a week. Industry compliance with this requirement had virtually eliminated any mold problem before the 1960's.

The grader cleans his hands and makes certain that his trier is not too warm or too cold. Washing the trier in hot water is taboo, since an excessively warm trier produces a greasy surface on the next plug of butter. With the cutting edges of the trier facing inward, the grader forces the trier through the butter to a sufficient depth to obtain a 10 or 12 inch plug. The trier is given a one-half turn to cut the butter, and the grader carefully withdraws a plug. If the sample is properly taken, the butter on the trier will show no roughness due to incorrect sampling. Immediately upon drawing the sample, the grader passes the trier with butter under the nose at a slight angle for the full length of the plug; the grader inhales gently as this is being done. During this procedure the grader makes certain that the inhaling is performed evenly and moderately, so that the aroma may be properly discerned. A mental record is then made of the aroma.

Using a spatula, the grader removes 1/4-inch to 1/2-inch of butter from the bottom end of trier plug, and quickly melts the sample in the mouth to identify the flavor characteristics and their intensity. The entire length of the trier-plug is examined for degree and uniformity of color and compared with the USDA color rod for proper shade classification; and the grader checks for the presence and degree of any color defects. The grader carefully observes the trier-plug for compactness, waxiness, and for defects such as leakiness. Slight pressure is applied against the sides of the plug until it shows a break to determine any weakness or crumbliness in body and texture. The grader then examines the back of the trier for any indication of free moisture, stickiness or ragged boring condition. Simultaneously the grader feels the butter melt in the mouth and is alert to any indication of a mealy or grainy texture. He also feels for the presence of any gritty salt between the teeth, which means undissolved grains of salt, and he checks for salt intensity.

Prior to expectorating the melted butter, the grader rolls it to the back roof of the mouth to detect palate flavors. The sample is then expectorated, noting the aftertaste and observing whether the flavors endure. The flavors and odors which have made their appearance are duly noted. This technique requires careful concentration and the grader needs a quiet environment, without distractions, to perform his work.

The grader then carefully replaces the trier-plug to assure a smooth and closed surface; he then folds the liners over so that the surface of the butter is completely covered.

If keeping-quality samples are to be taken, approximately 2-ounce samples of butter are transferred to sterile containers and placed in an incubator cabinet, thermostatically controlled, at 70°F. and held for 7 days; then they are reexamined for possible quality deterioration. Satisfactory results by this accelerated keeping-quality test indicates product stability in normal marketing channels.

In the grading of print butter, the grader checks the samples as to whether they are too hard or too soft to permit the determination of their true character and flavor. An official grade is not placed on any sample received or tendered for grading that are in a very soft condition. Samples less than one-quarter pound in weight are not eligible for grading. The grader observes the surface of the print butter and then examines the interior quality. To determine the true flavor characteristics of the interior of the sample, the grader breaks open the sample. This practice enables the grader to evaluate the flavor more accurately than by merely boring the sample with a small trier.

The mechanics of final quality evaluation of any lot of butter require that the grader ascertain, and rate the flavor, noting any defect in workmanship (body, color and salt), and that he record the intensities of color and salt. After the ratings for flavor, body, color and salt have been established, the grader assigns the U.S. grade for each churning. The flavor description and the nature of each defect in workmanship are shown on the grading certificate, as are the intensity of color and salt.

The style and condition of the containers are shown on the grading certificate, as are any irregularities in the packing, packaging material, or finish and appearance of the butter. The package is not considered in arriving at the final grade since it is not a constituent part of the product. However, if the condition of the package is such as to adversely affect the quality of the butter, no final grade would be assigned.

CHEESE

Inspection and Grading Equipment

As in the case of butter, the kind and character of cheese-grading equipment and supplies has changed during the past 50 years. Nickel-and chrome-plated triers with a blade length of 5 inches were used exclusively until the 1940's, when stainless-steel-triers with a blade length of 6 inches began to be used and virtually replaced the plated triers in the 1950's. In the case of barrel cheese, a stainless steel butter trier with a blade length of at least 12 inches, is used; a sharp knife splits the cheese plugs.

Starting in 1940, the cheese graders were furnished with a supply of a wax-sealing compound for sealing plug holes to prevent mold development. In the late 1950's, the sealing compound was changed to a soft petroleum-jel;

at this time the graders were furnished with a supply of parchment paper about 4 inches square to apply over the sealed plug holes. Since 1940 the graders have been supplied with one-quart metal sample cans with tight fitting lids for use in taking official samples when moisture and/or fat test is required; they have official stamps for proper identification of the graded cheese, and a supply of odor-free absorbent paper towels used in cleaning the trier between samples. The graders since the 1950's have also been supplied with a 5-inch pointed metal stem dial thermometer. Each grader is furnished with a supply of grading memorandums.

In addition, scales graduated to at least quarter-pound fractions are used in official test-weighing. The grader makes certain that the scales are in good condition, that they are approved and sealed by a city or State department of weights and measures, and that test-weights are available for checking the accuracy of scales.

Until the late 1940's, all Cheddar cheese had a paraffin or a paraffin-wax coating. At that time, rindless cheese of 40- and 60- pound blocks, film wrapped, made an appearance; after this, the production of paraffined cheese decreased appreciably, and has been very light since 1960. Barrel type cheese (about 500 pounds) came on the scene in the late 1950's.

During the late 1940's, cheese-mites became a problem, and the graders were furnished with "flash-o-lens" (combination flashlight and magnifying glass) for mite detection. The Inspection and Grading Branch initiated an intensive program to eliminate mite infestation by having industry pay greater attention to: sanitation of drying rooms and curing shelves, condition of cheese boxes, condition of cheese, bandaging and paraffining, and storage temperature (30 to 32°F.). With the cooperation of industry, the problem was controlled, if not practically eliminated, by the late 1950's.

Samples for Grading and Test-Weighing

Prior to 1940, most of the Cheddar cheese was test-weighed and graded for contract delivery; it consisted of small styles (daisies and longhorns), with some large styles, such as flats and cheddars. This cheese was paraffin coated and packed in wooden boxes, with "scale boards" placed top and bottom, and also in between, when more than one cheese was packed in the box. The scale boards afforded protection against possible damage and prevented the cheeses from sticking together or to the box.

During World War II, most of the Cheddar cheese test-weighed and graded -- several hundred million pounds -- was in the "cheddar" style. In the postwar years, it shifted to the production of rindless cheese (unparaffined) in 40- and 60-pound blocks, pliofilm wrapped.

As in the case of butter, prior to test weighing cheese, the grader checks the accuracy of the scales at zero, and uses test-weights at the range of weighting. The cheese is removed from the box and individual units

are weighed (one package is selected from each vat of cheese); or if in small styles, the number of units packed in a shipping container are weighed together. When paraffined cheese is involved, the scale boards are removed before weighing. In accordance with long-established practice, the net weight is recorded in pounds and quarter-pound fractions, as in the case of butter.

When test-weighing rindless cheese, the weight of the wrapper is deducted to determine the net weight of the cheese. Standard tare weights were established many years ago for the various wrappers (by type of wrapper) for both the 40- and 60-pound blocks. This information is furnished to the grader in official instructions. When rindless cheese is test-weighed at the manufacturing plant the grader is able to establish the tare weight for the wrapper.

During the past few years, with the advent of automation, some firms use automatic weighing equipment. This records weights in pounds and decimal fractions or ounces. When such equipment is used, the grader records the test-weight in full pounds and decimal fractions or ounces.

Grading Procedures³

The cheese grader requires that the Cheddar cheese be in proper condition, with a temperature range of about 50 to 55°F., to permit proper examination for aroma, taste, body and texture. No official grade is assigned to Cheddar cheese that is less than 10 days old, a requirement that has been in effect since 1940.

The cheese removed from the container is placed at a convenient level to permit proper and thorough examination of all surfaces. In the case of paraffin-coated cheese, the grader observes closely the condition of rind, adherence and appearance of paraffin, placement of bandage and circles, soiled surfaces, and size and shape of the cheese. The grader checks to see if scale boards are used on the top and bottom of the cheese, and between each individual cheese (if more than one cheese is packed in a box).

As with butter, the sample for quality evaluation is taken with a two-edged, curved-blade instrument known as a cheese trier. The edges of a cheese trier are sharper than those of a butter trier. A No. 8 cheese trier with a 5 to 6-inch cutting edge, 5/8 inch in diameter at the base, and 9/16 of an inch in diameter at the tip, is generally used. The trier is inserted into the cheese from the top, about half the distance from the outside edge to the center of the cheese. After the cheese trier is inserted, it is turned one-half around and withdrawn, bringing with it a long piece of cheese known as a "plug." The grader then breaks off about 1 1/2 inches of the outer end of the plug and replaces the balance flush with the surface in the plug hole. All plug holes are carefully sealed with a pliable sealing compound, and in the case of rindless cheese, the sealing compound is completely covered with a clean patch of parchment wrapper.

The graders are extremely careful when plugging rindless cheese, to avoid tearing the wrapper or pulling it loose from the cheese. The grader inserts the trier perpendicular to the surface of the cheese about half the distance from the outside edge to the center of the cheese. To avoid pulling the wrapper loose from the cheese, the grader places fingers on each side of the trier and holds the wrapper down while withdrawing the plug.

With respect to rindless cheese, the grader ascertains whether the wrapper is tightly applied and adequately sealed to preclude the entrance of air and that it otherwise conforms to the requirements for finish and appearance specified in the U.S. Standards for Grades. He carefully examines the sample to see that the cheese has a smooth, closed surface, and that the inner wrapper is not more than slightly wrinkled and is free from any cracks or openings and adheres closely to the surface of the cheese. The wrapper is examined for breaks, melting due to excessive heat, and if transparent, checked for the presence of mold. Wrappers that use wax as a sealing agent are examined to assure that sufficient heat was applied to melt the wax and fuse the overlapping surfaces. Wrappers employing sealing techniques other than wax are closely examined to determine if a complete seal is obtained. No final U.S. Grade is assigned if packaging is faulty. In case the defect is limited to a single sample, a U.S. Grade may be assigned to the other cheese in the vat if the grader determines that the defect is limited to the sample and is not indicative of the remainder of the vat or carlot.

The preliminary character and degree of aroma is ascertained by passing the cheese plug slowly under the nose. The grader then observes the color and determines whether its appearance is bright and clear or dull and lifeless; whether the color is uniform and free from mottles or light and dark portions, or if it has seams or faded areas surrounding the mechanical holes. The grader then observes the nature and extent of the openings in the cheese (mechanical or gas holes). He examines them closely to see whether they are regular, angular, rounded, large or small.

The grader takes the ends of the plug by the forefingers and thumbs of the two hands and bends the plug slowly into a semi-circle, observing when it breaks and the nature of the break. A portion of the plug is kneaded between the thumb and forefingers to determine the degree of firmness and smoothness of body, and whether the cheese is sticky, pasty, mealy, or crumbly.

By the working of the sample into a semi-soft ball, the temperature of the mass will have been raised by the pressure and by the heat of the hand, making it easy to detect the aroma. The aroma is observed by placing the worked mass under the nose. The grader compares this aroma with that noted when the sample was first removed from the cheese. He then places a small portion of the unworked plug into the mouth and grinds it up to a soft mass. The soft mass is rolled about in the mouth for several seconds to note its flavor, then it is expectorated.

For cheese packed in barrels or other bulk containers and weighing 100 pounds or more, a butter trier is used and the plug may be taken through the bung hole of a barrel or an opening in fiberboard containers. If a proper

plug cannot be obtained in this manner, the barrel cover is removed or the container opened. Due to the thickness of the butter trier, the surface of the cheese plug is often smeared when obtaining a sample. Accordingly, it may be necessary to split the plug into two parts with a sharp knife to observe the sample for mechanical openings or gas holes.

When laboratory analysis is required for fat and moisture on paraffined and rindless block styles, samples are taken in duplicate at the time of grading. The duplicate sample serves as a reserve in case the original sample is lost or damaged in transit to the laboratory.

When individual vats are tested for fat or moisture, the grader takes three plugs 3 inches long from each vat and places them in twirl bags or small containers. When samples are taken for a composite test on a carlot, one plug from each vat is taken. Usually this is sufficient to fill a sample can. The length of each plug is in proportion to the size of the vat; this obtains a weighted average test for the carlot. The sample containers or cans containing the cheese plugs are fitted with a tight fitting closure; they are wrapped and sealed in accordance with official instructions. All sample containers are packed in a fiber box with insulated packing material. In warm weather the samples are precooled prior to shipment and packed with dry ice or in reusable, frozen refrigerating cans. The shipment of samples to the laboratory is timed so they arrive with no delay in delivery due to holidays or weekends. Parcel post or special delivery service is generally used.

For laboratory analysis on bulk cheese (barrels), the samples are drawn the same as for paraffined and rindless cheese. However, since the composition of bulk cheese may vary from the top to the bottom of a container, due to the methods of manufacturing and processing, the covering certificate carries the following statement: "The laboratory analysis for moisture and/or fat is based on samples drawn from the top surface of the cheese and is not necessarily indicative of the composition of the entire lot."

NONFAT DRY MILK

In early 1935, when the Dairy and Poultry Products Division, Bureau of Agricultural Economics, USDA, first began to sample, test-weigh, and grade dry milk (then known as dried skimmed milk) the product was packed in slack wooden barrels holding about 200 pounds each.

The sampler was supplied with a long-handle spoon (about 20 inches long), 1-pound sample cans, can labels, stamps for proper identification of the sampled product, and sampling and test-weighing memorandums. Scales were made available by the vendor and checked for accuracy by the sampler.

The product was test-weighed prior to the taking of samples by selecting at random 5 percent or one out of each 20 barrels or fraction thereof in each lot. The barrels were stripped, weighing the nonfat dry milk in the liners.

This required removing the top hoop, the 1/4 hoop, and the barrel head; the barrel was inverted on the scale and the bilge hoop dropped on the scale to allow the staves to spread. The barrel was then lifted, leaving the dry milk in the liners. After obtaining the weight, the barrel was replaced, turned upright and the head placed in the barrel and the hoops replaced. The average tare weight was determined by weighing ten sets of inner and outer liners plus ten bilge hoops. Test-weights were recorded in full pounds and in quarter-pound fractions thereof. Intermediate fractions were recorded as the next lower full pound or quarter-pound fraction.

To avoid contamination, sanitary methods were employed in taking samples. When not in use, the sampling spoon was protected by wrapping in paper. With the spoon samples taken at various places in the container the condition of the powder was noted, and the samples placed directly into the sample cans, which were filled about three-fourths full; the lids were placed on the cans immediately. The sample cans were numbered consecutively, corresponding to the markings shown on the sampling and test-weight report, by use of labels fastened to the appropriate sample cans. In addition to the sample number, the can labels were marked with the method of manufacture (spray, roller or roller-vacuum drum), date, name of sampler and the name of the vendor.

The samples were carefully packed by the sampler (with the sampling and test-weight report) into a fiber shipping container which was sealed with gummed tape. The sampler signed his name diagonally across the tape and container, and shipped the samples, express prepaid by the vendor, to the laboratory for analysis. The liners of the slack barrels were tied immediately after the sampling of the product.

In 1941, the sampling spoon was replaced with a 28-inch plated flour trier, the opening being slightly tapered toward the tip. In the mid-1950's, the plated flour trier was replaced with a stainless steel T-handle untapered trier (33 inches overall length, with open slot 28 inches long and a 13/16 inch bore). The samplers were furnished a spatula to transfer the milk powder from the sampling trier into the sample bag and also a flashlight.

In 1944, the sample cans were replaced with kraft paper bags, glassine-lined. The sample bags were filled approximately two-thirds full and sealed immediately by folding the top (confectioners-style fold) and sealing it with gummed tape. The sampling bags were marked in the same way as for can-labels described above. In the mid-1950's the sampling bags were laminated with aluminum foil.

Announcement DA-31 (Apr. 26, 1946) provided for packing nonfat dry milk in fiber drums as well as in slack barrels.⁴ When the dry milk was packed in fiber drums, each manufacturing unit was given a subplot number and usually represented 4,000 pounds of product. The sampler test weighed and sampled one container for each 4,000 pounds or fraction thereof. By 1949, much of the nonfat dry milk sold to the Commodity Credit Corporation was packed in fiber drums holding 175 to 250 pounds each.

In 1949, during the course of a cycle or monitoring inspection of some Government-owned milk powder packed in fiber drums, one of the inspectors observed some insect infestation. The manufacturing plant was traced and an immediate survey was made to determine the source of infestation. The insect infestation was located and insect specimens were forwarded to USDA in Washington for identification. The entomologists of the Stored-Product Insects Branch, Market Quality Research Division, AMS, identified the specimens as Trogoderma and black carpet beetle. The matter was brought to the attention of the dry milk industry and all Federal and State-licensed sampling personnel were alerted to the problem.

Whenever insect infestation was encountered by the sampler, this information was noted on the "dry milk sampling report" and insect specimens were forwarded to the regional supervisor for appropriate action. The appropriate regional inspection and grading office in such cases issued a "Condition Only" certificate and the product was not eligible for sale to the Government.

The fiberboard drum with polyethylene liner and kraft liner was highly resistant to insect invasion after the nonfat dry milk had been placed in storage. This suggested that the primary responsibility for the prevention of insect contamination rested with the manufacturer of the nonfat dry milk.

Container Specifications for Dairy Products, LD-22 (Aug. 1, 1956) gave details for slack barrels, fiber drums and Type D, E, and F Multiwall paper bags. The proper bags were intended for the packing of 50 and 100 pounds of nonfat dry milk; they consisted of 5-ply or 6-ply construction with 3 mil polyethylene liners. The sample lot size for product packed in kraft paper bags remained the same as in the case of fiber drums.

Container Specifications for Dairy Products, LD-28 dated June 2, 1958, were essentially the same as LD-22, insofar as containers for the packing of nonfat dry milk are concerned. By the early 1960's, nearly all of the bulk nonfat dry milk offered to the Commodity Credit Corporation was packed in multiwall bags.

Starting Apr. 1, 1960, the Commodity Credit Corporation discontinued paying different prices for nonfat dry milk packed in barrels, drums, and multiwall paper bags.⁵ The slack barrels became obsolete shortly thereafter, and the fiber drums continued to be used until the early 1960's.

Starting in 1960, some of the nonfat dry milk manufacturers conveyed the nonfat dry milk from the dryer to portable tote bins holding about 3,000 pounds of product. In plants operating under the Resident Grading and Quality Control Service Program, an approved automatic sampling device was used for taking official samples.

USDA discontinued the purchase of roller process nonfat dry milk Apr. 1, 1962.⁶

The kraft paper bags with polyethylene liners and stitched closures, generally used starting in the early 1960's, were vulnerable to insect invasion. This matter was brought to the attention of the bag manufacturers, who conceived the idea of placing a pressure-sensitive tape over the stitching to offer greater protection against insects. On Mar. 14, 1963, the Government announced that effective Apr. 1, 1963, the buying price would be 0.2 of a cent per pound higher for nonfat dry milk placed in bags with sealed closures (tape over stitches).⁷ USDA announced on Mar. 18, 1965, that after Dec. 31, 1965, they would only purchase nonfat dry milk packed in kraft paper bags having closures sealed with a tape.⁸

Concerted and continued efforts on the part of the Inspection and Grading Branch, with the cooperation of industry, the Stored-Products Insects Branch, and the kraft paper bag manufacturers, brought the problem of insect infestation to the point of practical elimination in 1966.

On Apr. 1, 1970, the Commodity Credit Corporation discontinued the purchase of nonfat dry milk packed in 100-pound kraft paper bags.⁹

Announcement DP-1 (Jan. 15, 1971), covering the specifications for packaging and packing of dairy products, included only the requirements for the so-called Type G bag, in reference to nonfat dry milk. The pinch-style construction, without loose polyethylene liner, was added following satisfactory test shipment performance.

Announcement DP-1 was superseded by Announcement CMO-1 (Revision No. 1), Nov. 8, 1974. The specifications provided for multiwall paper bags intended for packing 50 pounds of product, constructed of three walls of flat or extensible kraft paper, and an inner 2 mil polyethylene liner. Provision was also made for a laminated paper bag.

The following basic sampling procedure has been adhered to since the advent of the kraft bag for packing nonfat dry milk.¹⁰ The sampler checks the accuracy of the marked tare weight on the bags by averaging the tare weight of 10 to 20 empty bags representative of the bags in the lot. The sampler examines the sample bags for proper closure and tying of poly liners where applicable. Poly liners are not opened until immediately before sampling. The liner is then folded over the edge of the bag to allow examination of the entire surface of the nonfat dry milk for uniformity of color, presence of lumps, and insects. If the sample is lumpy, the sampler notes on the dry milk sampling report the specific manufacturing lot or lots involved, the size of the lumps, and whether or not the lumps break up with very slight or slight pressure.

If insect infestation is found, the sampler shows all pertinent information on the DMS report and forwards the insect specimens to the regional supervisor for appropriate action.

The sample is drawn by inserting the dry milk sampling trier into the entire depth of the bag at such angle that a full trier is obtained. The sampler transfers the sample of nonfat dry milk by placing the trier

directly into the sample bag, filling the bag at least one-half full. The sample bag is immediately closed by folding several times, and is secured by the use of a metal tab sealing device. The sample bags are serially numbered consecutively, and appropriately shown on the DMS report. Each sample bag is identified with a large "S" in crayon or marking pen.

The sampler personally packs the samples, using a polyethylene bag to line the shipping case. The samples are packed in the proper sequence according to the serial number markings. The poly bag is tied with a heavy cord. A Griplock seal is attached over both ends of the cord next to the tie. The number of the seal is shown on the applicable AMS report.

The laboratory testing of the nonfat dry milk samples is subjected to chemical and microbiological tests, such as the following: determination of moisture content, butterfat content, solubility index, titratable acidity, scorched particles, standard plate count and direct microscopic clump count, and organoleptic examination for flavor determination, in accordance with methods of laboratory analysis published by the Inspection and Grading Branch, Dairy Division, AMS.¹¹

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- ¹ The sampling procedures for butter, Cheddar cheese, and nonfat dry milk and also the laboratory procedures for testing nonfat dry milk have been statistically supported.
 - ² U.S. Agricultural Marketing Service, Dairy Division. General Instructions for Inspection, Grading, and Grade Labeling of Butter. DA Instruction No. 918-10, Aug. 15, 1975. Available in Poultry and Dairy Quality Division, FSQS, USDA.
 - ³ U.S. Agricultural Marketing Service, Dairy Division. General Instructions for Inspection and Grading Cheese - Cheddar, Swiss, Bulk American for Manufacturing and Other Varieties. DA Instruction No. 918-20, Apr. 3, 1972. Available in Poultry and Dairy Quality Division, FSQS, USDA.
 - ⁴ This and other Announcements are available in Poultry and Dairy Quality Division, FSQS, USDA.
 - ⁵ U.S. Department of Agriculture, Press Release USDA 54-60, Jan. 8, 1960.
 - ⁶ U.S. Department of Agriculture, Press Release USDA 1190-62, Mar. 30, 1962.
 - ⁷ U.S. Department of Agriculture, Press Release USDA 858-63, Mar. 14, 1963.
 - ⁸ U.S. Department of Agriculture, Press Release 876-65, Mar. 18, 1965.
 - ⁹ U.S. Department of Agriculture, Press Release 1006-70, Mar. 31, 1970.
 - ¹⁰ U.S. Consumer and Marketing Service, Dairy Division. General Instructions for Sampling Nonfat Dry Milk. DA Instruction No. 918-30, July 13, 1970. Available in Poultry and Dairy Quality Division, FSQS, USDA.
 - ¹¹ Methods of Laboratory Analysis. Available in Poultry and Dairy Quality Division, FSQS, USDA.

DEVELOPMENT OF THE USDA DAIRY PRODUCTS
INSPECTION AND GRADING PROGRAM

In 1918, tentative plans were outlined for establishment of a formal inspection and grading service for butter on the principal central or terminal markets, and tentative rules were prepared. However, the formal inspection and grading program did not develop until the following year (100, 1918, p. 465; 102).

The passage of time led to the gradual development of a balanced dairy products inspection and grading program to meet the needs of the dairy industry and the consuming public. The evolution of the dairy products inspection and grading program took several forms. Initially, the inspection program was focused on shipments of butter, and soon after on other dairy products received at the large central markets. A few years later, the program was expanded to shipping points. In 1924 an interest developed in using the service at assembling warehouses located in the production area, on a resident basis.

The next phase developed in the mid and late forties, when industry expressed an interest in the inspection and grading service on a resident basis, at individual dairy products manufacturing plants. Inspection and grading activities declined sharply at the central markets, beginning in the late fifties, when the number of wholesale receivers dwindled. This situation had been developing over a twenty year period. A systematic plant survey program began in the early fifties and by the early sixties became a major part of the balanced inspection program. A permanent laboratory service was inaugurated in 1941, in concert with the various segments of the total operation.

CENTRAL MARKETS AND SHIPPING POINTS

The appropriation act for the Department of Agriculture for the fiscal year ending June 30, 1919, contained certain provisions, which for convenience were designated the "food products inspection law." The provisions were:

*For enabling the Secretary of Agriculture to investigate and certify to shippers and other interested parties the quality and condition of fruits, vegetables, and other perishable farm products when received at such important central markets as the Secretary of Agriculture may from time to time designate, under such rules and regulations as he may prescribe, including payment of such fees as will be reasonable and as nearly as may be to cover the cost for the service rendered: Provided, That certificates issued by the authorized agents of the department shall be received in all courts of the United States, as *prima facie* evidence of the truth of the statements therein contained.¹*

In the rules and regulations prescribed and promulgated by the Secretary of Agriculture under this law, butter is specifically designated as a farm product which may be inspected.

USDA inaugurated an inspection service on butter May 28, 1919, as a part of the Food Products Inspection Service of the Bureau of Markets.

The responsibility of establishing and conducting the USDA voluntary inspection and grading service on butter was charged to the Dairy and Poultry Products Division, Bureau of Markets, under the leadership of Roy C. Potts (101, p. 1). He in turn selected Charles W. Fryhofer, who was stationed at New York City in Mar. 1919, to supervise the butter grading program. Leon Gaylord, Ole S. Hagen, and Albert B. Loring received their training in the grading of butter from Fryhofer at New York City. On May 28, 1919, the butter grading service was inaugurated at New York City, Philadelphia, Boston, and Chicago. Gaylord was placed in charge of the butter grading service at Philadelphia, Loring at Boston, and Hagen at Chicago.

Dealers differed as to the necessity and value of this new inspection and grading service. The opposition was highly organized and very vocal. Some dealers contended that the Bureau of Markets butter inspection service was impinging upon the work of mercantile exchanges, and that an inspection service was unworkable (3, p. 3). Others felt that uniform grade standards and a uniform impartial grading system were practical, and could provide the basis for improving and standardizing quality and facilitating trade. Grading would also make the price reports for the various scores of butter more meaningful for the shippers and wholesale receivers.

In 1920, the butter grading service was extended to the Washington, D.C., market, and in 1922, to the San Francisco market (100, 1921, p. 16; 102, 1922, p. 519). Frank H. McCampbell was in charge of the San Francisco office and handled the butter grading work. The USDA butter grading service consisted of commercial gradings used to settle disputes between shippers and wholesale receivers, and between wholesale receiver and buyer. In addition, all of the butter purchased in the open market by the Navy Department in Boston, New York, and Philadelphia was contracted subject to USDA inspection and grading (100, 1920, p. 541). This also applied to butter purchased by certain state, municipal, and private institutions. The grading service was soon used by restaurants, hospitals, steamship lines, banks and railroads.

The grading of Cheddar cheese, based on U.S. grade standards was made available to the industry on the principal central markets, starting in Jan. 1923 (88).

The butter inspection service maintained at the Philadelphia market by the U.S. Department of Agriculture since 1919 had been so satisfactory that the Philadelphia Produce Exchange decided to discontinue its own inspection service in 1924, when it entered into a cooperative agreement with the Bureau of Agricultural Economics (85, p. 1). By this arrangement the Government inspected and graded butter sold on the Exchange. This was the first time that USDA had provided butter inspection service to a produce exchange.

In 1927, a new agreement was signed with the Exchange which included cheese and eggs as well as butter.² In 1925, a cooperative agreement was entered into with the Boston Fruit and Produce Exchange to cover the grading of butter. In 1928, the USDA extended its dairy products inspection and grading service to the Los Angeles market.³ In 1929, the inspection and grading service was extended to the Portland, Ore., and Seattle markets.^{4,5}

The cooperative agreement with the Philadelphia Produce Exchange was terminated as of July 1, 1933, and grading service was continued in cooperation with the Pennsylvania Department of Agriculture (87, p. 3). The cooperative agreement with the Boston Fruit and Produce Exchange was discontinued Aug. 1, 1933, and grading service was continued in cooperation with the Massachusetts Department of Agriculture (86, p. 3).

In May 1935, the grading service was extended to the St. Louis market and was conducted under a cooperative agreement with the St. Louis Mercantile Exchange. The agreement remained in effect until June 30, 1939.⁶ At that time, a cooperative agreement was consummated with the Missouri State Department of Agriculture and the College of Agriculture, University of Missouri.⁷

Dairy products, particularly butter, were for many years mainly marketed through wholesale receivers located at central markets. The USDA inspection and grading service was organized and structured accordingly.

Large cooperative butter-marketing associations were organized in the 1920's. They assembled butter from hundreds of member creameries at central warehouses where much of the butter was cut and wrapped, and shipped for retail distribution. Similarly, large grocery chains began to assemble butter direct from creameries; in the 1930's other corporate organizations followed suit. This method of operation bypassed the wholesale receivers, and their numbers steadily dwindled through the next three decades. As the 1970 decade approached, only a handful of wholesale receivers remained in business.

Other changes had taken place in the dairy industry, for example, the consolidation of plants, the closing of the small plants or using some as receiving stations. In addition, larger plants, in many cases, were designed and organized to handle several dairy products. Moreover, super-size regional cooperative manufacturing and marketing associations were organized.

Much of the butter inspection and grading work shifted from central markets to the individual manufacturing plants and country warehouses.

To accommodate the changing manufacturing and marketing patterns, USDA directed its attention and efforts to resident grading activities and quality control service and to a systematic plant survey program. Central to the inspection and grading service was the responsibility to encourage and assist in quality improvement, product stability and safety.

Historically, most of the cheese grading work has been conducted at manufacturing plants and at assembling warehouses. Likewise, most of the sampling of nonfat dry milk and evaporated milk has been handled at the individual plants or at country warehouses. The inspection and grading of dairy products is performed by Federal employees, except in States where the cooperating State agency provides employees who are qualified and licensed by the USDA for this work.

Grading Product on Piers and Team Tracks

Normally, butter inspections or gradings on the various central markets were conducted at the place of business of the wholesale receiver or at cold storage warehouses. However, in New York City, from the 1920's to the early 1950's, some of the butter inspections or gradings were made at the waterfront "piers." In Chicago, some were made in freight cars on "team tracks."

During the early part of this century, Chicago wholesale receivers of butter would dispatch horse-drawn wagons to the various railroad sidings where freight cars of butter (usually 300-63 pound tubs) were loaded onto wagons for delivery to their place of business or to a cold storage warehouse. In many cases, the wholesale receiver would request USDA or the Exchange to make an official grading and test-weighing of the carload of butter on "team track." Motor trucks replaced the horse-drawn wagons during the mid-1920's. Team track inspections of butter continued through the 1950's.

In the early 1950's, the New York City inspection and grading office required that appropriate samples be moved to the wholesaler's place of business for inspection or grading of the product.

Federal Surplus Commodities Corporation

The Federal Surplus Commodities Corporation, during the period from 1933 to 1940, purchased the following surplus poundage of dairy products for relief distribution (104).

Butter	--	266,135,104
Cheese	--	26,267,078
Evaporated Milk	--	141,585,745
Nonfat Dry Milk	--	<u>82,899,596</u>
Total		516,887,523

The products were officially inspected or graded before being offered to the Federal Surplus Commodities Corporation. The butter was of U.S. 90 score, U.S. 91 score and U.S. 92 score; the cheese was of U.S. No. 1 quality; the nonfat dry milk was of Extra grade; and the evaporated milk was inspected for compliance with contract specifications.

About 10 million pounds of Cheddar cheese was converted to pasteurized process cheese; and about 50 million pounds of butter were cut and wrapped into 1-pound consumer-size packages; all of this was handled under USDA resident supervision. The nonfat dry milk was packaged into 1-pound moisture-proof bags.

The Federal Surplus Commodities Corporation purchased the major dairy products on an offer and acceptance basis, with some purchases of butter made on the New York and Chicago Mercantile Exchanges. The FSCC purchased about 134 million pounds of Cheddar cheese on the Wisconsin Cheese Exchange during World War II, for Lend-Lease and the Armed Services (54, p. 912).

In addition, the Federal Surplus Commodities Corporation purchased sweetened condensed milk and dry whole milk from 1942 to 1945; and butter oil and Carter's Spread, from Jan. 1944 through June 1945. These products were inspected by USDA personnel.

While the Federal Surplus Commodities Corporation remained a corporate entity, it became the Distribution and Purchase Division of the Surplus Marketing Administration, June 30, 1940. The FSCC continued to function as one of the procurement agencies until its authority expired on June 30, 1945.

Butter-Grading Clinics and Conferences

To assist in the standardization and unification of the butter grading program, it was deemed essential that butter-grading clinics and conferences be conducted twice a year. The first session was organized and conducted by Edward Small and was held at St. Paul, Minnesota, May 1 and 2, 1937 (13, p. 8). Fifteen midwest butter graders participated in the clinic and conference phase of the meeting. A second grading clinic was held at New York City, May 8 and 9, 1937, where seven eastern graders participated.

At the conclusion of the 1938 grading clinics and conferences, it was decided that at such future sessions invitations would be extended to leading dairy research workers in the fields of bacteriology, chemistry, manufacturing, and engineering (95, p. 3). They would be asked to deliver talks on these subjects as pertinent to good manufacturing practices, quality improvement, keeping-quality and product safety. Federal-State butter graders of the Division's staff were also scheduled to take part in the evening programs.

From these beginnings there developed a regular scheduling of twice-a-year grading clinics and conferences, expanded in scope and changed in character to meet the needs of the changing inspection and grading programs, and the new technology. Likewise the changes were consistent with the needs of the dairy industry, for the ultimate benefit of the consuming public.

Establishment of Regional Supervision

The butter inspection and grading program had shown a substantial increase in the mid and late thirties. The expansion reached the point that it was no longer feasible to attempt to supervise the activity from the Washington office only.

The first regional supervisor, Bruce S. Mars, was stationed at Chicago, Oct. 1, 1937; and the second regional supervisor, Bennett J. Ommodt, at Los Angeles, Nov. 1, 1938.^{8,9} Mars was transferred to New York City, in Jan. 1940, and became the first dairy products regional supervisor for the eastern region.¹⁰

On Nov. 2, 1942, Ernest L. Reichart was appointed regional supervisor to oversee the cheese grading program, with headquarters at Chicago.¹¹ He was succeeded by Harold E. Meister, as regional cheese grading supervisor, in May 1943 for the duration of the wartime emergency.

The Los Angeles regional office was relocated to San Francisco, Feb. 1, 1943, and Floyd Fenton was designated as dairy products regional supervisor for the West Coast area.¹² On July 1, 1951, Ervin R. Bartle was designated as dairy products regional supervisor with headquarters at Minneapolis, Minn., and in Aug. 1951, Reuben H. Wilson was appointed to a similar position at Kansas City, Mo.^{13,14} This regional office was discontinued July 27, 1959.¹⁵ The New York City regional office was relocated to Syracuse, N.Y., Jan. 15, 1972, with LeRoy C. Iverson in charge.¹⁶

Recognition and Expansion of Grading Program

The widespread recognition and acceptance of standardization and inspection and grading services for dairy products by the mid and late 1930's was partly attributed to the educational and demonstrational programs conducted in cooperation with State extension services, State departments of agriculture, agricultural colleges, and other agencies. In addition, manufacturers, distributors, and buyers of dairy products gradually displayed greater confidence in the reliability of the inspection and grading service. Uniform Federal grade standards, properly applied, provided a generally understood measure of quality, which permitted trading without a personal examination of the product. This was especially important when dairy products were shipped long distances. The standards were made more effective by the uniform interpretation and application by the inspection and grading service.

In many instances, dairy products were Government graded and shipped long distances to critical buyers and often subjected to official regrading at the point of destination. As a specific example, starting in 1935 and continuing for many years thereafter, the State of California became a deficit producing-area in manufactured dairy products, particularly butter. To bring demand and supply into balance, the California wholesale receivers and brokers of dairy products found it necessary to import supplies from the midwest. Millions of pounds of butter were USDA graded annually at various midwest points and shipped to the Los Angeles and San Francisco markets with a very high degree of acceptance and satisfaction. Much of the butter was regraded by USDA graders at destination.

Service on a Self-Supporting Basis

From 1919 to 1939 funds were appropriated, on an annual basis, to conduct the voluntary inspection and grading service for dairy products. Since 1939 the inspection and grading service has virtually operated on a self-supporting basis and has not received any appropriated funds.

Prior to 1939 all monies collected for grading service at central markets and at manufacturing plants were transmitted to the U.S. Treasury Department, and placed under miscellaneous receipts. Effective July 1, 1939, arrangements were made to deposit the monies accruing from inspection and grading work to a Federal Trust Fund Account; withdrawals were authorized to cover salaries of personnel related to such activities, and other applicable expenses such as travel, rent and locked-in payments for administrative services.

Handling "Appeal Gradings" on Exchanges

Prior to the spring of 1940, "appeal gradings" on butter, originally graded and intended for sale on the Chicago and New York Mercantile Exchanges, were handled by Exchange grading personnel or by commercial graders deputized by the exchanges.

The Chicago Mercantile Exchange modified its butter inspection and grading rules to provide for a new "appeal grading" system. They adopted the U.S. grade standards for creamery butter and designated the USDA as the "appeal grading" agency to handle all appeal requests on butter offered for sale or sold on the Exchange, effective May 10, 1940 (6 p. 3). The same ground rules and procedures for handling appeal gradings on the New York Mercantile Exchange were adopted in Sept. 1940 (1 p. 4).

Grading Clinic Conducted for the Quartermaster Corps

The U.S. Army had maintained a small dairy products inspection staff between World Wars I and II. With the onset of World War II their inspection staff was expanded considerably.

In the fall of 1941, the Quartermaster Corps of the War Department requested the Dairy and Poultry Products Division, Agricultural Marketing Administration, to conduct a 1-week dairy products grading clinic at Chicago, Ill., for the benefit of the U.S. Army supervisory butter and cheese graders (83, p. 2). The clinic took place in November and was conducted by Edward Small and Walter J. Schriver. It consisted of lectures on the U.S. grade standards for butter and Cheddar cheese and grading demonstrations on these products; they covered a wide range in quality and characteristics. Time was allotted each day for an open discussion on the grade standards and the quality assessment of each package of butter and cheese. Emphasis was placed on the size and condition of the triers used, the correct grading techniques, the

proper temperature of the product for grading, the temperature of the grading room or area, and the external conditions for grading. Stress was placed on prohibition of smoking in the grading room, and relative freedom of noise so as not to detract from adequate concentration.

- 1 40 Stat. 1002.
- 2 Office records. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 3 Letter from Frank H. Campbell to the author, Feb. 3, 1975. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 4 Personnel folder of James E. Draper, Jr., Federal Records Center, St. Louis.
- 5 Personnel folder of Ernest J. Johnson, Federal Records Center, St. Louis.
- 6 Office records. Available in the Administrative Services Division, FSQS, USDA.
- 7 Ibid.
- 8 Personnel folder of Bruce S. Mars, Federal Records Center, St. Louis.
- 9 Personnel folder of Bennett J. Ommodt, Federal Records Center, St. Louis.
- 10 Personnel folder of Bruce S. Mars, Federal Records Center, St. Louis.
- 11 Letter from Ernest L. Reichart to the author, Mar. 19, 1975. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 12 Letter from Floyd E. Fenton to the author, July 13, 1975. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 13 Letter from Ervin R. Bartle to the author, Nov. 6, 1973. Available in the Poultry and Dairy Quality Division, FSQS, USDA
- 14 Letter from Reuben H. Wilson to the author, Jan. 24, 1975. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 15 Letter from Donald P. Weber to the author, Dec. 3, 1973. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 16 Letter from LeRoy C. Iverson to the author, Feb. 6, 1975. Available in the Poultry and Dairy Quality Division, FSQS, USDA.

WARTIME AND POST WARTIME OPERATIONS

Huge quantities of practically all dairy products were required during World War II by the United States military forces and war agencies, the Allied Nations, and the British Purchasing Commission.

The Dairy Products Marketing Association (DPMA), a quasi-government agency, purchased slightly over 1 billion pounds of dairy products during the period 1938 to 1947, and required USDA grading of these products. (42)

Obtaining experienced personnel to handle the extremely heavy workload created a serious problem. It was solved by using qualified State department of agriculture employees, college staff dairy products manufacturing specialists, and by recruiting experienced industry butter and cheese graders. The grading program also required the establishment of a USDA dairy products laboratory and the use of outside laboratory facilities and personnel.

Continued expansion of inspection and grading work on dairy products was necessary throughout the World War II period. Inspection, grading, and test-weighing of dairy products established the basis for payment for such products to be used by the Armed Forces, and by claimants under the lend-lease program.

During the first half of 1941, trading on the Wisconsin Cheese Exchange was very light and the Board of Directors considered closing the Exchange for the duration of the war (5, p. 1). However, the Federal Surplus Commodities Corporation announced it would purchase Cheddar cheese on the Exchange starting July 18, and Exchange rules were amended to permit Government purchases (14, p. 1).

On July 1, 1940, a contract of agreement was entered into between the U.S. Agricultural Marketing Service and the Wisconsin State Department of Agriculture, for the purpose of utilizing Wisconsin supervisory cheese grading personnel (eight in number) to handle the inspection and grading of Cheddar cheese purchased in Wisconsin by the Federal Surplus Commodities Corporation and other federal agencies.¹ The Wisconsin cheese graders had passed on millions of pounds of Cheddar cheese purchased under the government's lend-lease dairy program.

There had been some complaints that cheese originally graded by State inspectors as top Wisconsin State Brand was sometimes classified by USDA graders below the U.S. No. 1 grade required on sales to federal purchase agencies. In early 1942, this and other problems threatened to open a rift between the State department of agriculture and the dairy inspection division of the U.S. Department of Agriculture. The USDA officials considered it desirable to have the grading service under Federal auspices. The State board of agriculture refused to sign a contract placing the State graders under the Federal marketing service, pointing out that Wisconsin law did not permit the board to delegate duties imposed upon it by the legislature (34, p. 12). After a conference between officials of both agencies, the matter of jurisdiction and other disputes were temporarily settled with the state agency maintaining the independence of its inspection staff.

During the flush season of 1942 the state graders were extremely busy grading cheese purchased by federal agencies, to the neglect of their own duties and responsibilities. As a consequence the Wisconsin State Department of Agriculture cancelled the agreement, effective Aug. 1, 1942 (31, p. 1). The termination of this agreement demanded immediate action by the U.S. Department of Agriculture. The emergency grading situation was handled without any undue delay or hardship.

During the spring of 1942 the quality of Cheddar cheese was below par in Wisconsin and in other states. Accordingly a significant portion of Wisconsin State Brand cheese offered for sale to the Government did not qualify as U.S. No. 1, the contract grade. Some criticism was leveled at USDA for alleged stricter grading (12, p. 1). However, some in the industry admitted that the quality of Cheddar cheese needed improvement and suggested three main reasons for the increased quantity of poor quality cheese: (a) about 15 percent more milk than the previous year and almost 10 percent less help on the farms to take care of it, (b) more milking machines were used, and probably not taken care of properly, and (c) lots of creameries made cheese that lacked manufacturing expertise (19 p. 1).

To help break the bottleneck in cheese quality, the USDA's Bureau of Dairy Industry dispatched manufacturing specialists to Michigan, Minnesota, and Illinois with a mobile laboratory to instruct cheesemakers in the manufacture of good quality Cheddar cheese (15, p. 3; 20, p. 12). This program, along with the assistance of the cheese graders of the Dairy and Poultry Products Division, and of college staff cheese manufacturing specialists, contributed to an increase in the percentage of Cheddar cheese which qualified for U.S. No. 1 grade.

To help alleviate the temporary burdensome supply of Cheddar cheese that did not qualify for U.S. No. 1 grade, the Government announced that beginning July 3, 1942, it would buy limited quantities of a grade to be known as U.S. No. 2-A, the quality of which would be slightly below that of U.S. No. 1 grade (16, p. 1). Limited quantities of U.S. No. 2-A cheese were purchased for lend-lease shipments abroad and for relief distribution in this country.

The problems of manufacture, grading, procurement and delivery of product became much more complex as the war continued. At the same time, civilian demand, as well as war requirements, for all dairy products continued to expand. This basic condition was emphasized by the imposition of price ceiling regulations as the heavier demands continued in the late summer of 1942 to increase prices. When prices were fixed, supplementary regulations became necessary to govern the distribution of the limited supplies. Office of Price Administration regulations for dairy products, based on U.S. grade standards in most cases, resulted in an increased demand for grading service on the products included in the regulations.

The dairy products most essential in direct war programs were fairly plentiful until late in 1942. Beginning in November, however, it began to be necessary to take emergency steps to divide the supplies of the various dairy

products among the war agencies and among civilians (105, 1943, p. 9). Emergency steps were taken along three main lines: (1) limitation orders restricting the use of milk for particular products; (2) controlled distribution of limited supplies of particular products among civilians; and (3) set-aside or reservation orders requiring that a specified part of the production of various products be reserved for sale to Government agencies.

Direct war demands for dairy products increased sharply in the spring of 1943, with the growing military personnel and the improved shipping situation. With supplies restricted, however, it became necessary to impose rationing. Butter and the principal types of whole-milk cheese began to be rationed in Mar. 1943. Evaporated and condensed milk rationing was started in June 1943.

Set-aside orders either specified the percentages of production or supplies required to be reserved for designated agencies. Generally, the designated agencies included the War Food Administration, Armed Forces, and other war services such as Veterans Hospitals, War Shipping Administration, including ship suppliers, and contract schools for feeding Army and Navy trainees.

In 1943, arrangements for inspection and grading of dairy products were consummated with the War Shipping Administration at ports of embarkation. Services were rendered at the following points: Portland, Maine; New York, New York; Philadelphia, Baltimore, Md.; Norfolk, Va.; Charleston, S.C.,; Savannah, Ga.; New Orleans, La.; Galveston and Houston, Tex.; San Francisco; Los Angeles; Portland, Ore.; and Seattle, Wash. (110, 1944, p. 49).

Grading of dairy products for the Office of Price Administration was heavy during the latter part of 1943 and through 1944 (110, 1944, p. 49). To help the Office of Price Administration eliminate overgrading and black-market activities in butter, arrangements were entered into with that Administration to render butter grading service on a nationwide basis. The grade of butter was checked by USDA graders at various shipping points and terminal markets. In the course of this operation some discrepancies were found between grades established by Army personnel compared to those established by the USDA. As a result arrangements were made with the Army Quartermaster Market Center to check with Army inspectors on the grading of products accepted for the Armed Services by the Veterinary Corps (110, 1944, p. 49).

In the summer of 1944, the inspection and grading work performed for the War Shipping Administation was extended to include Boston, Mass.; Jacksonville, Miami, and Tampa, Fla.; Mobile, Ala.; Beaumont and Port Arthur, Tex.; and San Diego, Cal. In addition, arrangements were completed to provide grading service to the War Shipping Administration at country points, enabling them to purchase dairy products on a graded basis f.o.b. shipping point (107, 1945, p. 33).

During the period 1944-1945 heavy Government purchases of nonfat dry milk were made, exceeding 400 million pounds. Sanitary inspections were made at plants that were having an appreciable quantity of products rejected.

As a result of this work, guidelines on minimum requirements for facilities, operations, sanitation, and raw materials for dry milk plants were developed, for internal use only (107, 1945, 33). Substantial quantities of evaporated milk which were stored and held for a considerable period of time, required periodic inspections during 1944-1945 (107, 1945, p. 33).

Grading of dairy products performed for the Office of Price Administration continued heavy during the latter half of 1944. As a result of information obtained by the OPA through those gradings, two court cases were instigated, one in Chicago involving two butter dealers, and the other in New York, involving ten butter dealers. In both cases the reliability of the service was questioned but in both instances the courts upheld the dependability of the graders (107, 1945, p. 33).

In order to achieve greater uniformity of interpretation and application of dairy products standards, invitations were extended to the Army's national dairy products supervisors, in the summer of 1944, to attend a grading school conducted for USDA regional supervisors. Several Army supervisors attended the week-long school, and several hundred samples of butter and cheese were graded at different points, including Chicago, Green Bay, Wis.; and the Twin Cities in Minnesota. The correlation of grading by the Army supervisors and those of USDA was found to be quite satisfactory (107, 1945, p. 33).

Shipping companies expressed themselves almost unanimously in favor of continuing the inspection and grading service on dairy products after World War II in order to protect their purchases under private operation (108, 1946, p. 4).

During the period of fiscal years 1942 to 1949, the volume of dairy products inspected or graded was extremely heavy, particularly for the size of the inspection and grading work force. The listing below shows the volume by products and poundage of each.²

Butter	---	2,273,178,399
Cheddar cheese	---	1,713,346,745
Nonfat dry milk	---	2,568,630,718
Evaporated milk	---	4,489,465,742
Butteroil	---	22,086,165
Carter's Spread	---	46,625,765

The inspection and grading personnel met every need, as it arose, under very trying circumstances, frequently by working 12 to 16 hours per day. Getting the job done involved problems of logistics, transportation, hotel accommodations and tight time schedules, as many of the inspection or grading requests pertained to products located at the manufacturing plants or in the production area.

BUTTER GRADING FOR THE EXCHANGES

In 1948 Federal grading of butter on the New York City terminal market was considerably expanded, mainly because of an amendment of the New York Mercantile Exchange rules, effective April 1, which provided for accepting Federal certificates as a basis of trading (108, 1948, p. 6). The Exchange discontinued its own butter inspection and grading department and utilized the services of USDA graders.

The Chicago Mercantile Exchange discontinued its inspection and grading department and amended its rules, effective Jan. 1, 1949, providing for Federal grading of all butter sold on the "spot call" and all butter intended for delivery or actually delivered on future contracts (108, 1949, p. 12).

DAIRY PRICE SUPPORT AND ASSOCIATED PROGRAMS (1949-1976)

The first direct effort by the Federal Government to support prices of dairy products in the United States was made in Jan. 1930. The Federal Farm Board granted a loan to Land O'Lakes Creameries, Inc., to enable that cooperative to withhold temporarily some of its own butter, and if necessary to purchase additional butter in the open market, in order to stabilize dairy prices. On Jan. 9, 1930, the cooperative offered to buy top quality butter at 34 1/2 cents a pound, but nobody offered to sell at that quotation. In the succeeding three months, Land O'Lakes continued to repeat its offer, and by means of gradual purchases, accumulated nearly seven million pounds of top grade butter. Land O'Lakes sold portions of its seven million-pound holdings in carefully controlled amounts and by May 5, 1930, had disposed of nearly the entire seven million pounds (68, p. 215). No further price support action was taken until after passage of the Agricultural Adjustment Act of 1933, approved May 12, 1933.³

In the next several years, other authorities were utilized for support operations including the Jones-Connally Cattle Act of 1934, Section 32 of the Agricultural Act of 1935, the Agricultural Act of 1938, under which authority the Commodity Credit Corporation (CCC) made loans to the Dairy Products Marketing Association for the purpose of purchasing and storing dairy products, and later the General Commodities Purchase Program under the CCC charter authority.^{4,5,6}

Section 32 of the Agricultural Adjustment Act of 1935 also provided for price support activity on dairy products and a source of funds for such support. It authorized the Secretary of Agriculture to use an amount of money equivalent to up to 30 percent of the customs receipts received in a calendar year to encourage during the following fiscal year (1) exports of agricultural commodities and (2) domestic consumption of commodities by diverting them from normal channels of trade or by increasing their use among persons in low income groups.

Before World War II, price support purchases were made from time to time as part of a general effort to bolster prices and incomes of farmers.

There was no mandatory requirement that dairy prices be supported nor any level specified for them. Prior to World War II the laws authorizing price support were changed frequently.

The Steagall Amendment to the Act to extend the life and increase the credit resources of the Commodity Credit Corporation, approved July 1, 1941, required the Secretary of Agriculture to support at not less than 85 percent of parity the price for any commodities for which wartime increases in production were requested.⁷ The Stabilization Act, approved Oct. 2, 1942, raised the price support level to 90 percent of parity and provided that such support should be maintained for two years after the year in which the war was declared ended. As the declaration was made at the end of 1946, support on dairy and a number of other products continued at a minimum of 90 percent of parity through 1948. The Agricultural Act of 1948 required support of dairy products at 90 percent of parity, effective Jan. 1, 1949.⁸

On Feb. 8, 1949, a program was announced to support prices to producers for butterfat, primarily in farm-separated cream, at a national average of 90 percent of parity during 1949, by market purchases of butter on which butterfat prices to producers were based. The announced carlot purchase prices for U.S. Grade A butter at any location were 59 cents per pound for delivery before Sept. 1, 1949, and 62 cents for delivery on and after Sept. 1. The announced purchase prices for butter of U.S. Grade B were two cents lower in each period.⁹

On Apr. 14, 1949, an additional program was announced to support prices of milk going into manufacturing during 1949 at a national average of 90 percent of the parity equivalent price, by market purchases of nonfat dry milk solids, in addition to the purchases of butter previously announced. The announced prices for nonfat dry milk solids were 12.25 cents per pound for spray and 11 cents for roller type solids for delivery before Sept. 1, 1949, and 12.75 for spray and 11.50 cents for roller on and after Sept. 1.¹⁰

In the spring of 1949, there surfaced a number of complaints that the federal butter graders were downgrading butter in order to discourage sales to the government under the price support program (22, p. 8). In addition, it was alleged that the Production and Marketing Administration was attempting to make a profit, or safeguard itself against a loss, by buying the butter two cents cheaper than the grade at which it really should have been supported. Some butter manufacturers were reported as taking the position that they did not dare store lest they find their Grade A coming out as Grade B with a resultant two cent depreciation in value, or their Grade B coming out as 89 score with no government support applicable. These allegations were categorically denied by E.M. Norton, Assistant Director, Dairy Branch, PMA. Norton pointed out that the USDA graders did not know whether the butter was going to be sold to the government under the price support program or whether it was to enter the regular channels of trade. He also reminded the industry that many millions of pounds of butter carrying a government grading certificate moved into regular trade channels, whereas only a few million pounds of butter were sold to the government during the first 2 months (Apr. and May) of the 1949 marketing year.

The Dairy Record in an editorial comment was inclined to the view that those who took this suspicious attitude either offered a "gratuitous insult to the integrity of the Dairy Branch officials or else credit those officials with holding an undue concern about how they spent Uncle Sam's money" (10, p. 20).

Purchases under the butterfat and manufacturing milk programs through June 30, 1949, reached a total of 7,980,567 pounds of butter and 125,287,412 of nonfat dry milk solids. These products were held in storage at the end of the fiscal year and were available for sale in the domestic markets at not less than the purchase prices plus storage and other carrying costs. They were also available for school lunch uses and for sale to agencies administering foreign programs.

The Agricultural Act of 1949 introduced for the first time a range within which the Secretary of Agriculture was required to support prices for dairy products.¹¹ The law states that the Secretary of Agriculture shall support the price of milk and butterfat at such levels between 75 percent of parity and 90 percent of parity as will assure an adequate supply.

Dairy was only one of several livestock products covered by the Oct. 1942 amendment requiring support at a minimum of 90 percent parity for two years after World War II. From Apr. 1, 1949, through Mar. 31, 1971, milk and butterfat were the only major livestock food items for which price support was mandatory. The Agricultural Act of 1970 amended the 1949 Act to suspend the requirements to support butterfat in farm-separated cream for three years beginning with the 1971-72 marketing year.¹² The Agricultural Act of 1949, as amended by the Agriculture and Consumer Protection Act of 1973, terminated the mandatory requirement to support butterfat in farm-separated cream, effective Apr. 1, 1974.¹³

While CCC's purchase prices for cheese and nonfat dry milk have been uniform for all locations, CCC's purchase prices for butter since Apr. 1, 1953, have varied, depending on location of the butter. Location differentials in CCC buying prices were requested by the butter industry to facilitate distribution and merchandising of butter from the midwestern area of large production to distant consumer markets.

The announced support prices were for butter in blocks of 60 to 68 pounds and of U.S. Grade B and U.S. Grade A or higher, for Cheddar cheese of various styles and sizes, and of U.S. Grade A or higher, and for nonfat dry milk in bags containing 100 pounds (and in recent years also 50 pounds) and of U.S. Extra Grade (except not more than 3.5 percent moisture since 1952-1953).¹⁴

In the early years of the support operations, some industry people proposed that CCC buy and remove from the market lower quality products which they felt were damaging the general demand for dairy products. The proposal was not adopted for two reasons: (1) it was deemed advisable to supply only good quality products to school lunch and other programs; and (2) providing a continuing outlet for low quality products through CCC purchases would not be conducive to quality improvement (45, p. 20). Over the years, this basic premise has occasionally been challenged, but it still remains as a guiding principle in price support activities.

SALES FOR EXPORT OF AMERICAN CHEDDAR CHEESE
AND NONFAT DRY MILK

The Commodity Credit Corporation under Announcement LD-5, dated Apr. 16, 1954, was prepared to sell for export quantities from its stock of cheese and nonfat dry milk acquired under the program to support prices to producers of milk and butterfat. These commodities were sold as scheduled by the Commodity Credit Corporation each month in the announcement of export sales prices which were issued by USDA and published in the Federal Register.¹⁵

The cheese offered for sale was of U.S. Grade A or U.S. Grade B Cheddar cheese packed in boxes and strapped for export, based on the weight and packaging as shown by the USDA grading certificate covering the product at the time of its original purchase by the Commodity Credit Corporation.

The nonfat dry milk offered for sale was of U.S. Extra Grade, roller or spray process. The milk powder was packed in barrels or drums of approximately 200-225 pounds net weight.

If the purchaser desired to repack or process any of the commodity purchased under Announcement LD-5, he was required to so indicate in his offer and it was mandatory that the repackaging or processing take place in plants approved by the United States Department of Agriculture. Also it was required that any repackaging or processing be carried on under the continuous supervision of a representative of the Inspection and Grading Branch, Dairy Division, Agricultural Marketing Service.

Millions of pounds of American Cheddar cheese and nonfat dry milk were processed or repackaged under Announcement LD-5.

PUBLIC LAW 480 (1954)

The Agricultural Trade Development and Assistance Act, popularly known as Public Law 480, was approved July 10, 1954.¹⁶ It authorized sales of surplus agricultural commodities, from stocks acquired by the Commodity Credit Corporation under the price support programs or from private stocks, for foreign currencies, pursuant to agreements between the United States and friendly foreign countries. The law also authorized shipments for emergency relief and other aid, and to barter or exchange agricultural commodities owned by CCC for strategic or other materials required by our Government.

The law was fostered by the need for food and fiber abroad and the large surplus of farm products in the United States which were available to fill the need. The enactment of this law proved to be of considerable importance in disposing of surplus farm products abroad and in assisting the economics of the developing countries.

In 1959, the law was amended to increase dollar sales of surplus farm products to friendly nations through long-term agreements and the extension of credit.¹⁷ Until Jan. 1, 1967, Title II of P.L. 480 authorized the President of the United States to donate CCC stocks of agricultural commodities to friendly foreign nations to meet famine or other urgent or extraordinary relief requirements.

The Food for Peace Act of 1966 revised Title II of P.L. 480, replacing and broadening the foreign donation authorities previously contained in Section 416 of the Agricultural Act of 1949 and Title II.¹⁸ The new Title II, effective Jan. 1, 1967, authorized the President to:

"furnish agricultural commodities on behalf of the people of the United States to meet famine or other urgent or extraordinary relief requirements; to combat malnutrition, especially in children; to promote economic and community development in friendly developing areas; and for needy persons and nonprofit school lunch and pre-school feeding programs outside of the United States."

The Inspection and Grading Branch had responsibility for the inspection of the dairy products exported under Public Law 480, and for dockside condition inspection of the products prior to export.

The dairy products exported included bulk butter, repackaged butter in print form, butteroil, ghee, anhydrous milkfat, bulk cheese, repackaged natural cheese, pasteurized process cheese, and nonfat dry milk in bulk form, and repackaged nonfat dry milk in small-size packages. The exports also included dry whole milk, evaporated milk, and sweetened condensed milk.

A dairy products export Payment-In-Kind Program was instituted in the summer of 1962 for nonfat dry milk and in the fall of 1963, for butter and other products containing at least 75 percent of milkfat. The PIK Program was carried out in conjunction with Public Law 480. Inspection of dairy products was required at time of production and at time of loading for export. The exporter was required to obtain an inspection certificate issued by the Inspection and Grading Branch, Dairy Division, Agricultural Marketing Service, within 90 days of the time of export showing the weight and quality of the commodity for submission with the application for payment. From Aug. 1962 through Mar. 1966, the dairy products Payment-In-Kind exports amounted to 130.4 million pounds of butter and 929.1 million pounds of nonfat dry milk. Because of the PIK exports, the Commodity Credit Corporation's price support purchases were correspondingly smaller than they otherwise would have been. The Payment-In-Kind Program remained in effect through Mar. of 1966.

All dairy products exported under Public Law 480, including the Payment-In-Kind Program, required a dockside inspection prior to export. The dockside inspections were made by inspectors of the Inspection and Grading Branch, and the covering certificates issued showed the quantity of the product, condition of the container and verification that the product being exported was the same as that reported on the quality and weight inspection certificates.

In the case of exports shipped across the United States border by truck or railroad the dairy products could have been inspected at the point of loading and sealed under the supervision of an inspector of the Inspection and Grading Branch. The certificates resulting from such inspections were acceptable in lieu of dockside inspection certificates.

The dockside inspections of dairy products were heavy in the mid-1960's and tapered off appreciably in the late sixties as export sales decreased.

The San Francisco office of the Inspection and Grading Branch made their first dockside inspection of nonfat dry milk loaded at the manufacturing plant in large containerized trailer-truck vans, in early 1972. The vans were transported to the dock where huge cranes lift the compartment of the trailer-truck supporting frame and wheels and placed it directly on the ship intact. Prior to the actual ship loading, the van was opened by the USDA inspector and the product was identified according to the usual dockside inspection procedure. The nonfat dry milk was stacked about five feet high and there was ample room between the top of the bags of nonfat dry milk and the roof of the van for an inspection. This relatively new system was used on many products to help reduce labor costs, damage and other load losses.

DOD GRADING ASSIGNMENTS TO USDA

The Department of Defense periodically, starting in the summer of 1953, assigned to the USDA certain butter grading requests. In some instances the Inspection and Grading Branch, Dairy Division, was unable to accept the assignment because the product had been manufactured in a plant that was on the USDA ineligible list. The ineligible status by USDA ran the full gamut of deficiencies in sanitation, equipment and/or processing procedures. The USDA did not grade butter from such plants until the deficiencies were corrected as evidenced by a reinspection performed by a USDA plant survey inspector. Assignment of grading requests by the Department of Defense to the United States Department of Agriculture continued through the fifties.

The Department of Defense sent a notice to the trade on June 17, 1969, that the United States Department of Agriculture inspection for grade on butter, Cheddar cheese and Swiss cheese would be mandatory when a lot purchased contains more than 8,000 pounds and optional on lots with less than 8,000 pounds.¹⁹ The seller may also ask the USDA to inspect "for compliance with all specifications or contract requirements." The inspection and grading of the above mentioned products was assigned to the USDA by DOD in Sept. 1969 as a result of a General Accounting Office recommendation to eliminate duplication of inspections by USDA and DOD.

DAIRY PRODUCTS INSPECTION SERVICE FOR QUANTITY BUYERS

A special USDA service for buyers for restaurants, hotels, hospitals, steamship lines, and various institutions, both private and governmental, while available and used for many years, was given renewed attention in 1960. A bulletin (AMS-366) was published in Mar. 1960, explaining the service to the potential users. The service assured buyers of getting dairy products of the quality they specified. This was accomplished through certification by trained impartial Government graders that the buyers contract specifications had been met.

OVERSEAS INSPECTIONS

In July 1964, Joseph A. Rubis, Washington office staff, Inspection and Grading Branch, was sent to Guatemala to inspect nonfat dry milk which had been exported without prior dockside inspection.²⁰ The exporter had failed to request the inspection which was required to qualify for subsidy through the payment-in-kind program.

Also in July 1964, Arthur H. Kuecker, a member of the New York City regional office, handled an inspection of nonfat dry milk in Rotterdam, Netherlands, under circumstances similar to the Guatemala incident. In May 1965, Kuecker was sent to Tunis, Tunisia, to grade a shipment of two million pounds of unsalted butter. The butter was exported under the PIK program and the buyer would not accept delivery because some of the butter was off-condition. The grader found that 22 churnings had deteriorated below the grade specifications of the contract. In Oct. 1965, Kuecker was sent to Rotterdam, a second time to handle a dockside inspection of nonfat dry milk.

In Nov. 1966, an export firm requested the grading of five million pounds of bulk unsalted butter at five locations in France and one at Antwerp, Belgium. The butter, which was exported from the United States approximately 18 months prior to this request, had been held in storage since that time. The United States Department of Defense had contracted to buy the butter based on USDA grading of the product. The grading was handled again by Kuecker.

In Mar. 1972, Gordon Oman, a member of the Minneapolis regional office, was assigned to handle an appeal grading of butter in Belgium, exported by an American exporter.

The United States exporters had requested these overseas inspections and paid for the service.

In Apr. 1975, Gordon Monson, Eastern regional office, traveled to Mayaguez, Puerto Rico, to perform a condition inspection on 17,000 cases (510,000 pounds) of pasteurized process cheese intended for school lunch distribution.

Starting in late 1974, several inspection trips were made by Robert G. Semerad, Washington office staff, Inspection and Grading Branch, to western European countries to review the sanitary aspects of certain dairy processing equipment as to their compliance with established USDA specifications. Specifically, the inspections concerned "membrane processing" equipment, evaporators, spray dryers, continuous butter churning, and miscellaneous processing equipment. The expenses for these trips were borne by the equipment companies.

It appears that such inspection requests by both United States and foreign firms will continue. As new equipment is developed, there is an understandable lag in the development of 3-A Standards. The manufacturers are interested in USDA review for sanitary considerations before initiating sales efforts, for installation in USDA approved plants.

EXPORT BUTTER SPECIFICATIONS

Butter is one of the oldest dairy products in international trade. People have different preferences in terms of taste and type of butter. Considerable industry and Government interest developed in late 1964 to formulate a set of appropriate specifications for the exportation of butter to foreign countries. To assure that buyers of U.S. butter, and its sellers, thoroughly understood each other, applicable specifications were developed as a cooperative venture between the American Butter Institute, the Dairy Society International, the Foreign Agricultural Service, USDA, and the Dairy Division, Agricultural Marketing Service. A sales brochure was published in Feb. 1965, by the Dairy Society International and the Foreign Agricultural Service, as DSI/FAS Publication Number 31.

The specifications approved by the United States Department of Agriculture provided a basis for establishing contract provisions between buyer and seller concerning grade, quality, packaging and handling conditions of butter exported from the United States. Each shipment of butter in the form to be shipped (bulk or print) was subjected to a seven-day keeping-quality test at 70°F. (21°C), as a prerequisite to the issuance of a grading certificate. The exporter was required to supply information to the Inspection and Grading Branch, AMS, as to contract requirements and specifications, sufficiently in advance of the shipment to permit completion of the required inspection and certification. Millions of pounds of butter had been graded under this program during the period 1965 to 1971.

INSPECTION OF "BLENDED FOOD PRODUCT"

The Commodity Credit Corporation announced in 1966 the purchase program of a high protein "blended food product" to help combat the serious problem of malnutrition among children in the developing nations. The first purchases were made in early 1967. The blended food product, developed by researchers of the United States Department of Agriculture, is a mixture of corn meal, soy flour and nonfat dry milk, plus vitamins and minerals. Starting in the fall of 1970, the CCC began to purchase an instantized corn-soya-milk product; the first purchases of a sweetened instant CSM product were made in the fall of 1971. The blended product was packaged in 50-pound bags.

Inspection responsibility for the blended food product was transferred from the Grain Division to the Dairy Division of the Consumer and Marketing Service on Mar. 1, 1967.²¹ Inspection of this blended food product covers the formulation; packaging, weighing, checkloading and laboratory testing of the finished product. The laboratory testing is performed at the Dairy Division laboratory in Chicago. Samples of the product are tested for moisture, protein, fat, crude fiber, granulation (granular size), consistency, total bacteria count, dispersibility, Salmonella, E coli, and extraneous material. In addition, the samples are examined for flavor and appearance.

The blended food product at the present time (1976) is prepared and packaged at Crete, Neb.; Milwaukee, Wis.; Danville and Decatur, Ill. It has also been processed at Shawnee Mission, Kansas.

- 1 Contract of Agreement available in Administrative Services Division, FSQS, USDA.
- 2 U.S. Division of Dairy and Poultry Products. Annual Report, 1942-1949. Available in Poultry and Dairy Quality Division, FSQS, USDA.
- 3 48 Stat. 31.
- 4 48 Stat. 528.
- 5 49 Stat. 774.
- 6 52 Stat. 819.
- 7 55 Stat. 498.
- 8 62 Stat. 1247.
- 9 U.S. Department of Agriculture, Press Release USDA 275-49-2, Feb. 8, 1949.
- 10 U.S. Department of Agriculture, Press Release USDA 275-49, Apr. 14, 1949.
- 11 63 Stat. 1051.
- 12 84 Stat. 1358.
- 13 87 Stat. 221.
- 14 U.S. Department of Agriculture, Press Release USDA 607-52, Mar. 19, 1952.
- 15 19 F.R. 2195.
- 16 68 Stat. 454.
- 17 73 Stat. 606.
- 18 80 Stat. 1526.
- 19 Office records. Available in Poultry and Dairy Quality Division, FSQS, USDA.
- 20 This section is based upon records available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 21 Office records. Available in Poultry and Dairy Quality Division, FSQS, USDA.

USDA RESIDENT INSPECTION/GRAADING
AND QUALITY CONTROL SERVICE

USDA RESIDENT BUTTER GRAADING STATIONS

The concept of providing resident butter grading service at a central concentration point originated in 1917 with Gustav P. Warber, market investigator attached to the Dairy Products Project of the Bureau of Markets. While the seed for such a program was planted in 1917, it did not germinate until the summer of 1924.

The Minnesota Cooperative Creameries Association, St. Paul, Minn., (subsequently Land O'Lakes Creameries, Inc., when operation was moved to Minneapolis in 1926) recognized the need to pay for the butter of all member creameries according to grade; at the beginning of 1924 it hired its own butter graders. Some creameries accepted the grades given without question, some thought the grading was too strict; many asked for assistance in improving their butter quality. It was generally recognized that there was need for a system that would eliminate the slightest question of partiality in weighing and grading the butter. An outside referee was the need of the hour.

In Jan. 1924, the executive committee of the Association asked the Minnesota State Department of Agriculture to petition the U.S. Department of Agriculture to provide Federal inspection and grading service at the Association's two concentration or assembling warehouses (68, p. 162). Roy C. Potts was sent by USDA to help decide on a method acceptable to all. Arrangements were made with the Minnesota State Department of Agriculture for a Federal-State butter grading service, with the cost to be borne by the Association through a trust fund set up for this purpose.

The Association announced that beginning on July 14, 1924, all butter received at the St. Paul and Duluth warehouses would be officially weighed and graded by Federal-State graders (68, p. 164). The first two official butter graders were Ole S. Hagen and Samuel G. Gustafson, stationed at St. Paul and Duluth, respectively. In Oct. 1924, Gustafson was transferred to St. Paul and was replaced at Duluth by George W. Hagberg. Then Charles W. Fryhofer, who had resigned in May 1924 as a butter grader and supervisor on the New York City market, was rehired in Oct. 1924, as the supervising grader for the official butter grading program at St. Paul and Duluth. The Federal-State supervision of grading had demonstrated its reliability and impartiality; both of these traits were necessary to create and maintain producer and consumer confidence.

The member plants of Land O'Lakes Creameries, Inc., used a rigid quality standard in the grading of the cream delivered by cream patrons, with the payment of a premium for sweet cream that would make 93 score sweet cream butter.

In the spring of 1925, the service was extended to the Chicago branch of Land O'Lakes Creameries, Inc., with Raymond L. Fedderson as the first resident grader.¹ When he resigned a few months later to accept a commercial position, he was replaced by Glenn A. Gilbert.

The Challenge Cream and Butter Association in Los Angeles, Cal., and Consolidated Dairy Products Company in Seattle, Wash., made application for resident butter grading service in 1929.² E.L. Wetmore and S.G. Gustafson were designated as official graders at these stations, respectively.

In the midwest in the mid-thirties considerable interest developed in the resident butter grading service. Official grading service was installed at the National Butter Company, Dubuque, Ia., in Mar. 1935.³ Orval H. Ause was appointed as the first inspector, but after several months he resigned to accept a commercial position in Chicago. He was replaced by Hubert R. Meier in Aug. of 1935.

In Feb. 1936, resident butter grading service was installed at Armour Creameries (Division of Armour and Company, Chicago, Ill.) Mankato, Minn., and two months later at its Dubuque, Ia., warehouse.^{4,5} The official butter graders assigned to each of these stations were Arthur E. Groth and Walter J. Schriver, respectively. The contract of agreement for inspection service at Armour Creameries called for quality control service both at the station and at the supplying creameries. Groth and Schriver made a significant contribution in assisting creameries in their quality improvement efforts. Bennett J. Ommodt and Ole S. Hagen also made noteworthy contributions to the total quality improvement program at Mankato (operation moved to St. Paul in Apr. 1937).

Butter grading service was also installed at the Iowa State Brand Creameries, Mason City, Ia., in May 1936.⁶ Russell C. Willey was the first butter grader assigned to this operation. Willey also participated in quality control service, assisting the member creameries in their manufacturing problems.

At each of these grading stations, the user of the service was required to furnish to the shipping creamery a copy of each grading certificate, covering each lot of butter received. This procedure enabled the creamery operator to know how each churning of butter was characterized and officially graded, and also whether the official test-weighing verified the marked net weight of the individual packages. When butter was officially graded on the terminal markets, the common practice was for the wholesaler to send a copy of the grading certificate to the creamery only when the shipment was found to be faulty or below the represented quality. This practice did not help the image of the Government grading service.

Tour of Butter Grading Stations

A one-week tour of the USDA butter grading stations was conducted by the Division of Dairy and Poultry Products, BAE, June 22 to 27, 1936, following the American Dairy Science Association meeting at State College, Penn. (96, p. 3). Edward Small, who had technical supervision of the butter grading service of the Bureau, was in charge of the tour and demonstrated the application of the U.S. grade standards for butter.

Invitations to join the tour were arranged by Roy C. Potts and were extended to members of the dairy manufacturing sections of the departments of dairy industry of the State agricultural colleges and of the Bureau of Dairy Industry, USDA; invited also were coaches of dairy products judging teams of the State agricultural colleges. Other representatives of the colleges interested in butter grading and quality improvement work were likewise invited, as were State departments of agriculture and industry representatives. More than 40 representatives participated in the tour; some made the complete circuit (4, p. 15).

The purpose of the tour was to enable the representatives to obtain more intimate and thorough knowledge by actual experience in the grading of butter at grading stations in Illinois, Iowa, and Minnesota. The tour also enabled the participants to gain first hand information as to the quality improvement and standardization program operative at each of the stations visited.

The tour began in Chicago, with a visit to the trading floor of the Chicago Mercantile Exchange and the grading of butter at the warehouse of Land O'Lakes Creameries. Subsequently, butter was graded at the warehouses of the National Butter Company of Iowa, and Armour Creameries, Dubuque; and at Iowa State Brand Creameries, Mason City. A visit was made to the Department of Dairy Industry of Iowa State College in Ames. Following this visit butter was graded at the warehouse of Armour Creameries, Mankato and Land O'Lakes Creameries, Minneapolis.

Correspondence containing gratifying expressions about the benefits accruing from the one-week tour of the butter grading stations came to the Division of Dairy and Poultry Products, BAE. Letters of appreciation came from representatives of experiment stations, from faculty members of agricultural colleges, from the district manager of the Land O'Lakes Creameries and the manager of the National Butter Company of Iowa, as well as from field representatives of the Division. The two managers indicated that they thought that bringing Division graders from different sections of the country for such a demonstration was a real necessity. The Division men expressed their enthusiasm over the opportunity to broaden their knowledge in the grading field. Typical of the comments concerning the week's tour from those representing outside agencies and industry are the following.

V.C. Manhart, dairy marketing research, Agricultural Experiment Station, Purdue University:

...I found that I was able to get quite a number of new viewpoints relative to the marketing of butter from the various inspectors. Your inspector from New York (L.D. Reekie) particularly gave me some very interesting information relative to the marketing of foreign butter. The butter scoring held at the Land O'Lakes warehouse was also very informative and I recognize the need for individuals to score with recognized authorities at occasional intervals in order to keep on a sound basis (94, p. 5)

Dr. B.W. Hammer, dairy bacteriologist, Iowa State College:

...I think the tour of the butter grading stations was an excellent thing...It seems to me that these tours offer a wonderful opportunity for a close contact between commercial people and Federal and State employees (94, p. 5).

Professor M. Mortenson, head of Department of Dairy Industry, Iowa State College:

...I consider that the tour which we made together was of considerable value and interest to me personally. Besides that of getting a better understanding of the marketing of our butter, there was another advantage which I considered to be of even greater importance, namely, that of judging butter together and thereby coming closer to a uniform standard (94, p. 5).

George Schulze, district manger, Land O'Lakes, Chicago:

...I feel that in order to secure uniformity in grading between the different Government inspectors that they should be brought together at least three or four times a year in order for them to standardize their ideas in regard to quality (94, p. 5).

H.A. Harmison, manager, National Butter Company of Iowa:

...Your tour of the grading stations here in the Middle West is a very wise and profitable step in clarifying and organizing the work of your Department...Personally, I cannot too strongly urge you to have as many of your men as possible from the four large central markets accompany you on this tour. It is my personal feeling, as you have more men stationed here in the West, they should become familiar with the eastern market conditions and your eastern men should become more familiar with western conditions (94, p. 5).

Instructions to Resident Butter Graders

The first Memorandum to Butter Graders issued in 1936 by Edward Small included instructions to resident butter graders:

- (a) Each churning in each lot of butter to be test-weighed and graded and evidenced by an official grading memorandum from which an official certificate was issued.
- (b) Selection of samples from each lot of butter for keeping-quality test. A 2-ounce sample from each churning to be incubated at 70°F. for 7 days and then examined for possible off-flavors.
- (c) Notifying the designated plant official of all creameries producing butter of unsatisfactory keeping-quality and withholding approval of such lots of butter for packaging with grade identification.
- (d) Daily checking of print room sanitation, condition of equipment, butter storage rooms, and storage and condition of packaging supplies.
- (e) Maintaining a daily check on all products packaged with official identification to assure that only eligible product be used for packaging with official identification and checking for proper code identification.
- (f) Maintaining complete file of grader's memorandums and grading certificates, keeping-quality records, and approved copies of all packaging material bearing official identification.
- (g) Reporting to the designated official any and all deficiencies in the packaging operation, and the storage conditions of butter and supplies.

These instructions were updated from time to time and on Mar. 6, 1953, Bennett Ommodt, Harold Meister and Joseph Rubis issued Instruction No. 918-3, "Dairy Inspection and Grading Handbook," a compilation of a series of technical instructions pertaining to methods and procedures governing the inspection, grading, sampling, weighing and supervision of packaging of dairy products--superseding Dairy Products Memorandums No. 1 to No. 18, inclusive. One section of the Handbook was devoted to butter grading at receiving stations.

In addition to the instructions outlined in (a) to (g) above, the Handbook required the resident grader to select periodically and at random, samples of print butter representative of each plant's production, for incubation to determine keeping-quality of the printed butter. This was a check against the keeping-quality samples taken at the time of grading and before the bulk butter was printed. Also, the resident butter grader was required to notify his supervisor of any delay by the designated plant official in instituting corrective measures concerning deficiencies called to his attention. The Handbook was gradually phased out and superseded by instructions structured to deal with individual facets of the total inspection and grading program.

In some instances grade labeled butter was shipped before the results of the keeping-quality test were known, and in a few cases the incubation test revealed quality deterioration. To shore up this situation, a ruling was made that no certified butter could be shipped until supported by satisfactory keeping-quality results.

After many years of operating under these restrictions, the procedure was modified in late 1975, permitting the shipping of certified butter, when a satisfactory keeping-quality case history for the creamery or creameries had been established, without waiting for the results of the 7 day incubation period. This appeared to be a justifiable position, owing to the policy of 1963, requiring that all creameries must be surveyed and approved twice each year before any production from that plant could become eligible for official grading service.

By far the greatest portion of the butter packaged under the USDA trademark originated from the official resident butter grading station operation. The number of official butter grading stations reached a peak in 1960, when 14 separate contracts for such service were in force, located in all except the New York region. Since the mid-1960's there has been a steady decline in the number of resident grading stations, sinking to a low of four in 1972 and presently holding at that figure. This sharp decline resulted from a change in manufacturing and marketing operations.

With the flourishing of the practice of assembling butter at receiving stations from numerous creameries, the industry was using conventional or batch churning almost exclusively and the butter manufactured from such equipment required chilling before printing or packaging for the retail market. With the development of improved "continuous churning" and "soft butter printers" a large segment of the industry switched to the direct packaging of butter at the large multi-product dairy plants.

The resident butter grading station program was expanded by Edward Small from 1935 to 1940. The technical and administrative supervision of this program has been conducted at the national and regional level.

USDA GROUP-PLAN GRADING AND QUALITY CONTROL SERVICE

In the mid-1930's some interest developed in using the USDA dairy products grading and quality control service on a group-plan basis under contractual arrangements. The emphasis was to be placed on grading, quality improvement, stability of product, standardization, and sanitation. The first contract was entered into in May 1935 with the Illinois Producers Creameries, Chicago, Ill. (an affiliate of the Illinois Agricultural Association).⁷ The service was made available to eight member plants scattered throughout Illinois. Carl O. Tuttle was assigned to handle this project and was engaged in the grading of butter as well as assisting with quality problems at the farm level and at the manufacturing plants. A ninth member plant was added to the contract in June 1937. While this operation lasted only slightly over 2 years, the concept was the precursor to the inauguration of the USDA resident grading and quality control service program on an individual plant basis.

Two other group-plan operations were installed in the 1950's, and covered various dairy products.^{8,9} Each of these contracts was operative for several years, with the last one being concluded in 1962.

The group-plan operations were supervised at the national, regional, and State level.

USDA RESIDENT INSPECTION OF OFFICIAL CHEESE PROCESSING OPERATIONS

At the start of 1946, some members of the process cheese industry expressed an interest in utilizing the USDA resident inspection and quality control service which would permit the merchandising of pasteurized process cheese and cheese foods under the USDA inspection legend.

In April 1946, the first USDA resident inspection service was installed at the Wheeler Cheese Company, Green Bay, Wis., where pasteurized process cheese and cheese foods were manufactured and packaged for the Great Atlantic and Pacific Tea Company (A & P), New York City.¹⁰ The finished products were identified with the official inspection shield. John R. Jarvey was assigned to this operation as the official inspector and remained there for the duration of the contract, which ended in Oct. 1951. From 1946 to 1953, the resident inspector was guided by Instructions issued in 1946 and supplementary directions issued from time to time. The Dairy Inspection and Grading Handbook (1953) contained instructions on a step-by-step basis for the inspector's guidance.

The section of the Handbook dealing with the Cheese Processing Plant required the resident inspector to:

- (a) Grade the bulk cheese for condition and quality to determine acceptability for use in processing based on requirements in the applicable PMA Instructions.
- (b) Inspect the bulk cheese to determine suitability for a specific blend and to make certain that the cheese had been properly cleaned prior to processing.
- (c) Observe results of sediment tests on the bulk cheese from each plant supplying bulk cheese, and reject any vats of cheese containing excessive sediment or other extraneous matter.
- (d) Select representative samples of the finished process cheese and grade the cheese for flavor, body and texture, slicing and color to determine compliance with finished product specifications contained in applicable PMA Instructions.
- (e) Collaborate with the plant technician in performing laboratory tests to determine composition of finished process cheese for compliance with identity standards of Food and Drug Administration.

(f) Record daily on the cheese grader's memorandum manufacturing lot numbers, date of manufacturing, number and size of packages in each lot, and the total marked weight in pounds for each variety of process cheese.

(g) Prepare a cheese grader's memorandum covering each week's total production of process cheese for use in preparing the covering cheese grading certificate.

(h) Issue, at request of applicant, a cheese grading certificate to cover any specific lot or lots of bulk cheese; in this case such lots were not included on the certificate covering the week's production.

(i) Insert on the grader's memorandum, for inclusion on the cheese grading certificate, the following statement covering acceptable product:

"The process cheese products covered by this certificate were processed under USDA inspection in accordance with the PMA Instructions governing process cheese plants."

(j) Issue, for use in preparing certificate, a separate grader's memorandum covering all lots of process cheese rejected as not complying with applicable PMA Instructions.

(k) Maintain complete file of grader's memorandums, grading certificates, keeping quality records, and approved copies of all packaging material bearing official identification.

(l) Maintain a constant check on all products packaged with official identification to assure that only eligible product is used for packaging with official identification, and determine that the code identification on packaging material is proper and legible.

(m) On a daily basis, check condition and sanitation of plant and equipment, wholesomeness of raw materials used, storage of finished products, storage and condition of packaging supplies, condition of plant and storage with respect to insect or rodent infestation.

(n) Report any and all deficiencies in wholesomeness of raw materials, sanitation, and general plant operating conditions, or other non-compliance with PMA Instructions to the designated plant official, and also report to his immediate supervisor any delays in action by the designated plant official in instituting corrective measures.

Starting in 1967, the resident inspector was guided by the requirements set forth in the "General Specifications for Dairy Plants Approved for USDA Inspection and Grading Service." These were generally the same as outlined above, except for greater specificity in some areas.

This program was developed at the national level by B.J. Ommodt from 1946 to 1959, assisted by Harold E. Meister; it was updated under the leadership of Meister from 1959 to 1968, and Edwin F. Garbe, from 1968 to 1974. Joseph A. Rubis assisted in the supervision of the program from 1951 to 1973.

The resident cheese processing operations were supervised at the national, regional, and state level.

USDA RESIDENT GRADING AND QUALITY CONTROL SERVICE AT MANUFACTURING PLANTS

Wholesomeness, high quality, and stability or keeping-quality are essential characteristics of dairy foods. Only through the application of strict quality control measures--from the time the milk is produced to the time the finished products leave the dairy manufacturing plant on their way to market outlets--can high quality, stability and wholesomeness be realized.

In the late 1940's, some members of the dairy industry manifested an interest in the USDA developing an impartial, uniform system of evaluating the quality of dairy products on a full-time resident basis. Such a system was developed and after several years was utilized by the dairy industry nationwide, based on compliance with prescribed specifications for dairy plants and on well recognized U.S. grade standards and product quality specifications.

Dairy products manufacturers interested in inspection, grading, and quality control service on a full-time basis made application for assignment of a USDA inspector to their plant under a contract of agreement. The cost of such service is borne by the applicant; the resident inspector (quality control technician) receives his salary from the Federal government. Dairy plants satisfactorily meeting the "General Specifications for Dairy Plants Approved for USDA Inspection and Grading Service" and demonstrating a sincere desire to produce wholesome, high quality products, are eligible for a resident grading and quality control service program.

The regional supervisor or the supervisory grader for resident programs makes an initial appraisal of the plant's facilities, equipment, practices of maintaining sanitation, and the quality of the raw milk supply. An adequately equipped laboratory is an essential part of an approved plant. Bacteriological and composition tests are necessary control checks to assure that top quality products meet grade or quality standards. The resident inspector assigned to an approved plant is qualified and specially trained to offer continuous technical assistance to plant management by: evaluating the quality of raw materials, checking the manufacturing procedures, grading the finished products, and issuing certificates on products for use in marketing. The inspector's know-how is backed up by the experience and technical knowledge of the Dairy Division's specialists and by the field laboratory.

The plant is entitled to pack its products in consumerized packages identified with official USDA grade or quality shield. Depending on the product on which it appears, the shield may designate the quality grade, or it may read "Quality Approved" and contain the statement "U.S. Department of Agriculture Grading and Quality Control Service."

The resident program is designed to assist managers of dairy plants in orderly marketing of dairy products and in improving overall plant operations so as to produce finished products consistent with the quality of the raw material used by the application of good manufacturing practices.

The regional supervisor, his assistant, or the supervisory grader for resident programs reviews with plant management the aims and objectives of the resident grading and quality control program and advises how the program can be tailored to the specific plant operations for maximum efficiency.

One USDA inspector is generally assigned to a plant. However, plant facilities, type and size of operations, number of products handled--these factors determine if more than one inspector is needed for the program. Two or more plants may be grouped under one program, using one central laboratory if the distance between plants is not so great as to allow the inspector to utilize his time efficiently. In such a case, usually two or more inspectors are needed.

Experience has clearly shown that the plants get maximum benefits from the technical expertise of the inspector and USDA when the inspector is in charge of the plant laboratory. There should be an understanding as to the need for laboratory facilities and equipment, for the resident inspector's responsibility for direction, and for the supervision of laboratory and quality control operations. It is essential that lines of communication and reporting are established between the resident grader and the plant official(s). Plant management is required to designate the individual with whom the inspector communicates reports and quality problems.

Qualified plant laboratory technicians are licensed, as necessary, to assist the resident inspector in laboratory analysis and to permit the resident grader to fulfill other responsibilities in the plant.

The first organization to use the resident inspection service on a full operating basis, including laboratory testing, was the Rochester Dairy Cooperative in Rochester, Minn.¹¹ The program was installed in Feb. 1948, with Harley Wood as the first inspector assigned. In May 1949, Robert Rossi was assigned as chemist to handle the laboratory analytical work exclusively.¹² He was succeeded by Wesley Bryant in Nov. 1950. The products covered were: butter, nonfat dry milk, dry whole milk, and ice cream mix. The service was discontinued in Aug. 1952 with the expiration of the contract.

The resident grading and quality control service was renewed at Rochester Dairy Cooperative in July 1964 with Richard W. Webber the grader in charge from July 1964 to Aug. 1967.¹³ The service covered butter, nonfat dry milk, Swiss cheese and sterilized milk. The program continued until Sept. 1969.

In 1950, resident grading and quality control service was instituted at Producers Creamery Company in Springfield, Mo., on various dairy products.¹⁴ In Jan. 1953, additional service was added to the contract to provide for supervision of weighing, sampling, and testing patron's milk. The grader, Roy F. Hedtke, made regular checks on: accuracy of the scales, recording of

weights, mixing and sampling of each patron's milk; he performed check tests for butterfat by periodically testing composite samples of patron's milk. An official statement was attached to each remittance to the individual patron. This unique phase of the service was continued to Jan. 1973; the balance of the program was continued on a full time basis until Jan. 1974 and since then on a half-time basis. Roy Hedtke, the initial USDA resident grader at this plant, served from 1950 to 1962; Roy B. McCrum served from 1962 to 1968 and James L. Matthews from 1968 to Jan. 1974. Miles W. Rawhouser has been assigned to the plant on a half-time basis since Jan. 1974.

The dairy industry witnessed some drastic changes in technology and marketing, starting in the mid-1960's; this lasted for several years, resulting in consolidation and merger of dairy plants, building of large multi-product plants and the closing of many hundreds of small dairy plants. In some instances the smaller plants were utilized as receiving stations. This period also witnessed the formation of three large regional cooperative marketing associations.

Some of the larger organizations desired to utilize the USDA resident grading and quality control service at the individual dairy products manufacturing plants. This resulted in a substantial increase in the number of plants engaged in the program.

In 1968, the peak year, a total of 53 dairy plants utilized the resident program, including about 300 receiving stations. At the end of 1976, a total of 36 dairy plants were involved in the program; they included about 140 receiving stations.

To help illuminate the way the program is monitored and managed, the duties and responsibilities of those engaged in the operation are outlined below:

The resident grader: (1) checks quality of raw milk supply and other raw products used in processing and manufacturing of products; (2) checks plant procedures on rejection of raw products and materials to assure compliance with "General Specifications;" (3) checks processing, packaging, storage, and shipping of products to assure that processing and handling are done in a sanitary manner in accordance with acceptable procedures; (4) samples finished products for quality and condition and for compliance with applicable U.S. grade standards or plant specifications, and issues certificates or reports as may be required by plant management; (5) performs keeping-quality tests and other tests on finished products, as applicable, to check stability of products for market channels; (6) performs a minimum of four surveys per year of plant and facilities, either independently or with the supervisory grader. Also makes frequent cursory surveys to check plant sanitation, condition of building, equipment, and operating methods to assure production of high quality, wholesome products; (7) supervises licensed plant inspectors performing laboratory analysis or other duties as specified; (8) checks products packaged with official grade identification to assure that only products graded and complying with grade and quality designation on packages

are actually packaged; (9) maintains a complete file of grader's memos, certificates, sampling reports, and keeping-quality records and maintains a file of approved copies of packaging materials bearing official identification and submits for approval copies of all new materials bearing official identification to the supervisory grader for transmittal to the Washington office; (10) maintains close liaison with designated plant official(s) and reports to him results of quality checks, plant deficiencies, or any problems and recommendations for improvement to maintain high levels of operation; (11) reports to the supervisory grader product quality problems or any deficiencies which do not comply with "General Specifications" and which he cannot get plant cooperation to correct; and (12) avoids activity which could be construed as a conflict of interest or could cause the grader to be obligated to the plant.

Other responsibilities are: (1) official inspection and grading services and laboratory analysis are required to be performed, in accordance with the Inspection and Grading Branch's instructions; (2) inspection and grading service and laboratory testing performed in accordance with plant or buyer's specifications when products are formulated for specific needs; and (3) preparation of records and reports for the regional office are in accord with prescribed instructions. To prevent unauthorized use, numbered certificates are kept in locked file of desk.

The Washington office provides: (1) nationwide program direction, coordination, and policy formulation; (2) the regional supervisor provides region wide program coordination, administration, and supervision; (3) the supervisory grader, assigned responsibility by the regional supervisor, provides direct supervision of resident graders, and makes periodic surveys of resident plants at least twice a year; one survey places emphasis on plant compliance with "General Specifications," the other emphasizes and checks on laboratory equipment and USDA services; he also checks on feeder plants and receiving stations to assure uniform application of the "General Specifications" and to assist the resident grader as may be applicable; (4) reviews survey reports prepared by the resident grader, assigns plant status, and transmits survey reports to management with appropriate comments; (5) recommends training for resident graders to improve skills or for development of new skills to provide additional services to the plant; and (6) makes recommendations to the regional supervisor and the Washington office for changes or improvements in policy, procedures, or services provided under the Resident Grading and Quality Control Service Program.

The resident grading and quality control service program was developed at the national level by Bennett J. Ommundt from 1948 to 1959, assisted by Harold E. Meister. It was expanded by Meister from 1959 to 1968, when leadership of the program was assumed by Edwin F. Garbe. Joseph A. Rubis had technical supervision of the program from 1959 to 1969, and George W. Fry from 1969 to the present time.

The resident grading and quality control service at individual manufacturing plants has been supervised at the national, regional, and State level.

- 1 Personnel folder of Raymond L. Fedderson, Federal Records Center, St. Louis.
- 2 Office records. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 3 Personnel folder of Orval H. Ause, Federal Records Center, St. Louis.
- 4 Letter from Arthur E. Groth to the author, June 26, 1974. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 5 Letter from Walter J. Schriver to the author, Jan. 29, 1975. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 6 Letter from Russell C. Willey to the author, Feb. 27, 1975. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 7 Office records. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 8 Letter from Harold K. Linden to the author, May 6, 1974. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 9 Letter from Wesley J. Ketcham to the author, June 19, 1974. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 10 Office records. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 11 Letter from Harley Wood to the author, May 14, 1975. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 12 Note from Robert Rossi to the author, Nov. 18, 1975. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 13 Office records. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 14 This section is based upon records available in the Poultry and Dairy Quality Division, FSQS, USDA.

GRADE LABELING PROGRAM

BUTTER

Resident butter grading service had been established in the assembling warehouse of the Minnesota Cooperative Creameries Association, St. Paul, Minn., July 14, 1924; after a few months of operation the cost of the service became a problem to the organization.

At that time Roy Potts conceived the idea that the USDA butter grading service would have an added value to the Minnesota Cooperative Creameries Association if it could be carried through to the consumer. Potts envisioned that the use of a certificate of quality (forerunner to the USDA grade label) enclosed in the retail package would show this fact to the consumer (68, p. 165). When this was suggested it became apparent that such a "tool" had advertising appeal and that the merchandising program would be greatly strengthened by the advertising program. The suggestion was accepted by the Minnesota Cooperative Creameries Association, if approval could be obtained at the bureau level. Lloyd S. Tenny, Assistant Chief, Bureau of Agricultural Economics, approved the proposal.

Simply stated, the certificate of quality idea was an effort to advance the sale of good quality butter according to set and prescribed rules and regulations of grading, packaging, and merchandising. It was realized that such a program would affect all phases of the butter industry--from the producer to the consumer--from the consumer in the small rural areas to the consumer in the larger metropolitan areas.

The question then arose as to what should be the approved form of the certificate of quality. The first certificates of quality bore a facsimile signature of the grader and were regarded as miniature grading certificates; they were 2 by 4 inches, and used as separate inserts in each carton of certified butter.

The first certificates of quality issued in Nov. 1924 carried the following statement:

United States Department of Agriculture
Minnesota Department of Agriculture, St. Paul
CERTIFICATE OF QUALITY
I hereby certify that I personally inspected
the butter contained in this package and that
the quality of it was 93 score or higher

C.W. Fryhofer
Federal-State Butter Inspector (68, p. 165)

The number of the grading certificate and the date of grading was perforated on the certificate of quality. The name of the grader was deleted starting in early 1926. Effective Apr. 15, 1926, the revised certificates of quality read:

CERTIFICATE OF QUALITY

Issued by authority of the
United States Department of Agriculture
Minnesota Department of Agriculture

This is to certify that the churning of butter from which the butter in this package was taken was inspected by an official federal-state butter inspector and that the date of said inspection and the number of the inspection certificates issued are perforated hereon and that the quality of it was 93 score or higher.

Land O'Lakes Creameries, Inc.
St. Paul, Minn. (68, p. 166)

Effective July 1, 1927, the certificate of quality was revised to the extent that the word "inspected" was changed to "graded;" "inspector" was changed to "grader;" "inspection" was changed to "grading" and "inspection certificate" was changed to "grading certificate."

The certificate of quality program did not provoke any appreciable opposition at the outset. This may have been because industry felt that Land O'Lakes Creameries, Inc., as a marketing organization would not be successful and that the volume of certified butter was not sufficiently large to manifest itself materially in the various consuming markets. However, Land O'Lakes Creameries featured their certified butter in 1925 and 1926 with considerable success, and the organization showed rapid growth. The trade and industry could not and did not overlook this progress; as a result the use of certificates of quality gradually irritated them until a vigorous protest developed in the summer of 1926. They attacked the program because they considered it:

- (1) A scheme to give Land O'Lakes Creameries, Inc., an unfair advantage in the sale of their butter as against the production of local-cooperative and independent creameries.
- (2) A scheme to eliminate individual initiative and encourage monopoly of the dairy business by cooperatives.
- (3) Misleading to the consumer on the grounds that the certificate of quality implied that the quality was 93 score at the time of purchase, which might not be the case.

Concerted industry effort was made to force the Department of Agriculture to discontinue the authorization of merchandising Government graded butter with certificates. The New York Mercantile Exchange, the Philadelphia Produce Exchange, and other eastern exchanges passed resolutions condemning the practice of merchandising certified butter, and sent delegations to interview William Jardine, Secretary of Agriculture, in an attempt to have the program discontinued (68, p. 167). George L. McKay, then Secretary of the American Creamery and Butter Manufacturers Association (now the American Butter Institute), used many forums opposing the certified butter program and appealed to Jardine to discontinue the program on the basis of "unfair trade practice."

Jardine, unmoved by the many angry delegations that came to see him, made it quite clear that the privilege of merchandising government graded butter under certificates of quality was not "unfair competition." The program was on a voluntary basis, open to any organization willing to pay the cost. The reverberations of these angry delegations reached President Calvin Coolidge himself. Efforts to condemn the program proved fruitless, and as the years passed, many firms merchandized their butter in this manner.

In Sept. 1932, the certificate of quality was again revised to indicate that the quality or score of the butter shown thereon was on a "when graded" basis (92).

In 1929, the certified butter program was extended to include U.S. 92 score butter, however, very little interest was shown in this service until 1936. At that time Armour Creameries, (a Division of Armour and Company, Chicago) Mankato, Minn., and Dubuque, Ia., began to merchandise large quantities of U.S. 92 score certified butter.

Keeping-Quality Test

In the summer of 1936, Edward Small introduced informally the keeping-quality test as an integral part of the certified butter program, which was largely centered at the official butter grading stations, with the balance at the central markets. Formal approval of the keeping-quality test was given June 13, 1938.¹ The Department used this test in conjunction with other quality improvement efforts.

The keeping quality test was developed by John A. Nelson, Montana State College of Agriculture, Bozeman, while working for an advanced degree at Iowa State College of Agriculture, Ames, in the early 1930's (59). The usual practice was to incubate a 2-ounce sample of each churning of butter intended for certification, at 70°F., for 7 days. Generally, the incubated samples were given a preliminary examination at the end of 72 hours. Some packagers of certified butter used a more accelerated test and incubated the samples at 98°F., for 2 days. The samples at the end of the incubation period were classified as Excellent, Fair and Very Poor. Samples found to be "very poor" were considered unsatisfactory and not eligible for packaging with certificates of quality.

Butter from the responsible creamery could not be used for the certified program until the deficiencies causing the marked deterioration in quality were corrected as evidenced by a plant survey and by satisfactory keeping-quality tests for 30 days. The keeping-quality test has continued to function to this day as an important tool in predicting product stability performance.

In the late 1930's the usual practice was to imprint the wording of the "certificate of quality" on the individual wrappers; however, similar approval was not given to printing this on the cartons until the early 1940's.

Survey of Quality of Selected Brands

Considerable criticism of the government certified butter program continued to surface from time to time. It was recognized that a number of variables could affect the keeping-quality of butter between the time of manufacture and the time of purchase by the consumer. This would apply to all butter, not merely to the certified product. To test the market quality of certified butter and comparable brands of uncertified butter, Edward Small recommended that the Bureau of Agricultural Economics conduct a survey at the retail level in the two most representative markets, New York City and Chicago (73). Such a survey was conducted between Jan. and May 1938, covering 230 samples at New York and 264 at Chicago. The butter purchases were selected from four distinct income level areas and the gradings were made by Federal butter graders--the samples were identified by code number only.

The survey showed that a consumer who bought butter with a certificate of quality issued by authority of the U.S. Department of Agriculture was likely to get a product of higher quality than if the butter did not carry the certificate.

A great deal of the ungraded butter could not meet the stringent standards required under the certified program. The report indicated, however, that some butter sold without certificates of quality was just as good as the butter with certificates.

Time Limit for Packaging, Supervision of Packaging and Requirements for Packaging Certified Butter

In Oct. 1941, a time limit of seven days was placed on all government graded butter intended for packaging with certificates of quality; the time limit was extended to 10 days, effective Sept. 1955.^{2,3}

At the same time provision was made for the selection of a qualified company employee to be licensed by USDA, under performance or surety bond, to act in the capacity of a supervisor of packaging. The supervisor of packaging was required to take inventory of all packaging supplies before any butter was graded for the certified program. He also checked in any supplies received after the certified program was in operation. In addition,

he was required to maintain official records on the product packaged with certificates of quality, and maintain inventory of certified packaging materials, on a monthly basis. The duties and responsibilities of the supervisor of packaging have remained essentially the same over the years.

In Apr. 1942, the Agricultural Marketing Administration issued certain requirements as a prerequisite to approval for the packaging and handling of butter under the certified program; the requirements were revised Feb. 1944 (111). Specifically the requirements related to: (1) sanitary condition of the butter printing and packaging rooms; (2) the taking of proper samples of butter for keeping-quality tests; (3) the taking, preparing, and handling of official samples of butter for official grading (utilized only during World War II); and (4) the duties of supervisors of packaging, and of supervisors of persons whose services were utilized in the supervision of packaging. These requirements have been updated periodically since 1944.

In the summer of 1947, provision was made for the option of using a "grade label" in place of the certificates of quality.⁴ The grade label was designed in the form of a shield containing letter grades or dual grade designation, in lieu of straight numerical scores. For example, U.S. Grade AA (U.S. 93 score), or U.S. Grade A (U.S. 92 score). It was not until 1955 that virtually all of the packagers and distributors of certified butter switched to the shield grade label bearing the letter grade; the transition was slow. During the period 1955 to 1972, two different grade shields were used to identify U.S. Grade AA butter. One design was for graded butter under USDA inspection and the other was used for graded butter processed and packed under USDA quality control service.⁵ Starting in 1972, all USDA Grade AA certified butter was labeled as packed under USDA inspection.⁶

In 1955, the certified butter program was extended to include U.S. Grade B or U.S. 90 score butter.⁷

Merchandizing Certified Butter Outside The Continental United States

In Oct. 1964, a firm in the Virgin Islands became the first distributor outside the continental United States to merchandise butter with official U.S. Grade AA labels.⁸ In Jan. 1965, a Puerto Rican firm became the second distributor outside the continental United States to merchandise U.S. Grade AA butter.⁹ The butter for both distributors was graded and packaged in New York City.

Volume of Certified or Grade-Labeled Butter

There has been a steady and almost uninterrupted growth in the volume of butter merchandised under the official certified program. The certified program was given a substantial boost, in the mid-thirties, when the National Butter Company, Dubuque, Ia., Armour and Company, Mankato, Minn., and

Dubuque, Ia., and Iowa State Brand Creameries, Mason City, Ia., entered into an agreement to install Federal-State resident butter grading service at their respective warehouses (90, p. 1). Only during World War II was there a marked reduction in the poundage of butter sold under the certified program. Immediately after World War II, there was a resumption of the steady increase in the volume of butter sold under the official grade labels. The increase in the number of packagers and distributors showed a growth pattern paralleling the volume figures. In 1969, there were over 75 packagers and more than 600 distributors participating in the program, using the U.S. shield to assure consumers a product of wholesome, dependable, uniform quality. Those figures have remained somewhat constant ever since.

The quantities of officially graded butter packaged with certificates of quality and grade labels are shown below.¹⁰

<u>Year</u>	<u>Graded and packaged with official identification</u>	<u>Pounds</u>
1930		28,869,000
1935		46,965,000
1940		88,588,000
1945		52,214,000
1950		79,637,000
1955		124,000,000
1960		188,000,000
1965		242,000,000
1970		286,000,000
1971		275,000,000
1972		340,000,000
1973		352,000,000
1974		311,000,000
1975		350,000,000
1976		315,000,000

Land O'Lakes, Inc., in Minneapolis, Minn., has been merchandising Government certified butter under the Grade AA label for 52 consecutive years, longer than any other manufacturer-distributor of butter.

Jewel Food Stores, headquartered at Melrose Park, Ill., has been merchandising Government certified butter under the Grade AA and Grade A label for 41 years, longer than any other retailer of butter.

The five largest packagers of USDA grade labeled butter, as of December 1976 were:

1. Associated Milk Producers, Inc. - New Ulm, Minn.
2. Keller's Creamery Company - Harleysville, Penn.
Division of Beatrice Foods
3. Land O'Lakes, Inc. - Browerville, Minn.
4. Land O'Lakes, Inc. - Mountain Lake, Minn.
5. Wisconsin Dairies Cooperative - Reedsburg, Wis.

The USDA resident quality control service is utilized at all of the above manufacturing and packaging plants, except Keller's Creamery Company.

PASTEURIZED PROCESS CHEESE

Early in 1946, an interest developed in the merchandising of pasteurized process cheese and related products under official USDA inspection legend. The Great Atlantic and Pacific Tea Company in Chicago was the first organization to apply for the merchandising of such products under the certified program.¹¹ The products were manufactured by The Wheeler Cheese Company, Green Bay, Wis. Before the program could get under way, it was necessary that the plant, premises, equipment, and facilities be surveyed and officially approved. This was done in the spring of 1946. It was also necessary that the manufacture of the pasteurized process cheese and cheese foods be conducted under resident USDA inspection and supervision.

Soon several other firms participated in the certified program, for varying periods of time. This type of service was utilized by the industry through 1974.

The original inspection legend in the form of a shield contained the words, "U.S. Inspected--Processed and Packed Under Continuous Inspection, U.S. Department of Agriculture." The inspection legend was imprinted on the immediate plastic wrappers and the individual cartons.

The shield was modified in 1955 to show that pasteurized process cheese was processed and packed under USDA quality control service.

The peak volume merchandised under the certified program was reached in 1951, with a total poundage of 59,369,000.¹²

CHEEDAR CHEESE

Some manufacturing and marketing organizations in the twenties and thirties showed an interest in improving quality and uniformity of Cheddar cheese. As a part of this movement, in early 1934, the National Cheese Producers Federation, Plymouth, Wis., and Land O'Lakes Creameries, Inc., Minneapolis, Minn., entered into a contract agreement to manufacture and market high quality Cheddar cheese. In the spring of that year they made application to USDA to have their cheese government graded and marketed as U.S. 93 score. The program was launched in April 1934, under the supervision of Emil A. Zorn, Wisconsin State supervisory grader for cheese, jointly employed by the State and USDA (57, p. 8). During the month of April, there were 16 factories making 93 score cheese and in May, 25 factories were making high quality U.S. 93 score cheese. The individual cheeses were stamped with the U.S. 93 score grademark. The operation was short-lived and was discontinued in the fall of 1935.

It was not until 1958 that one of the cheese manufacturing organizations in Wisconsin indicated a desire to have their Cheddar cheese identified with the U.S. Grade AA label. The management of the Lake-to-Lake Dairy Cooperative, Manitowoc and Kiel, Wis., and that of the marketing cooperative, Land O'Lakes Creameries, Inc., Minneapolis, Minn., got together with representatives of the Dairy Division, AMS to discuss the requirements for such a program. The aim was to find a way to come up with the same quality, fine flavor, smooth texture, firm body, and uniform color, finish and appearance, in every batch of cheese, time after time--to earn the privilege to label consumer packages of Cheddar cheese with the U.S. Grade AA shield.

Thus, began a 3-year-long effort on the part of Lake-to-Lake plant and personnel in the Inspection and Grading Branch of the Dairy Division. During this period, all of the facets of cheesemaking were carefully examined and evaluated. Checks were made of the quality of the milk supply and the effectiveness of the milk grading program. They experimented with different "starters" (cultures of flavor and acid-forming bacteria), changing the timing of "make" procedures, varying temperature in curing, constantly analyzing samples of cheese at various stages of production and improving their "make" techniques. Sanitary procedures were checked and the cheese was examined, inspected and graded, until everything measured up to the requirements for the U.S. AA grademark (47, p. 6).

They perfected the production of three curing categories:

Mild - cheese which has a short ripening or curing time, usually 2 to 3 months. It has a mild, slightly developed characteristic Cheddar cheese flavor, firm body, and smooth compact texture.

Mellow-aged - cheese which has been moderately ripened, for 4 to 7 months. It has fairly well developed Cheddar flavor and smooth flexible body and texture.

Sharp - cheese which has been well ripened, generally for 8 to 12 months. It has a fine, full, highly pleasing Cheddar flavor, smooth waxy bdy, and velvet-like texture.

These three cures went on the market in 1961 with the U.S. Grade AA mark under two brand names sold primarily in the Midwest, South, and East.

In 1965, U.S. Grade AA Cheddar cheese began to appear in some California cities. Two Los Angeles foodstore chains began packaging Grade AA Cheddar cheese in consumer size packages, under a combination of their own labels and the cheese makers'. The bulk cheese was originally graded at the Wisconsin cheese factory. When it arrived in California the quality was checked again by a USDA grader before it was cut and wrapped in consumer size packages in the stores' delicatessen kitchens. In 1966, another Los Angeles chain joined the program. More than 100 stores in the Los Angeles area affiliated with these three chains were selling cheese bearing the U.S. AA grademark (67, p. 3).

The official grade shield used in this program covers U.S. Grade AA Cheddar cheese graded and packed under USDA inspection.

NONFAT DRY MILK

During the early 1950's, an increased demand developed for consumer-size packages of nonfat dry milk. This was further manifested by an industry interest in merchandising nonfat dry milk under the USDA certified program.

Grade labeling of nonfat dry milk in consumer-size packages was approved by USDA in the spring of 1952.¹³ The first program was initiated at Sanna Dairies, Inc., Menominee, Wis., in April of that year under the USDA resident grading program, the product being identified with the U.S. Extra Grade shield. H.P. Hood and Sons, Boston, Mass., was the second organization to merchandise nonfat dry milk under the U.S. Extra Grade shield. Roberts Dairy Company, Omaha, Neb., was the third organization to use the official grade shield on nonfat dry milk. The product was manufactured and packaged for them at Maple Island, Inc., Stillwater, Minn., under the resident grading program. The product was instantized starting in 1959.

Sanna Dairies, Inc., continued to use the official trademark until June 1955; H.P. Hood and Sons likewise until June 1955, and Roberts Dairy Company until January 1964.

At the time the "Minimum Specifications for Approved Plants Manufacturing, Processing and Packaging Dairy Products" was published in 1955, the use of the USDA grade label on nonfat dry milk was limited to the Grading and Quality Control Service shield which required continuous inspection of the raw material and manufacturing and packaging operations.

In the mid-1950's, the "instantizing" of nonfat dry milk was developed by which regular dry milk is made into the popular "instant" variety. This is accomplished by a complex process which makes the dry milk powder into larger, more easily dissolved flakes. A single-step instantizing process was soon developed and successfully marketed.

When grade labeling of nonfat dry milk was initiated in 1952, the volume for the year amounted to slightly over 1 million pounds. In 1953 and 1954 the volume reached a level of about 3.5 million pounds annually, but dropped to about 1 million pounds in 1955.

There was a further drop in the volume of official grade-labeled nonfat dry milk in 1956 and 1957 and a slight rise in 1958 and 1959, but at a level of less than 1 million pounds.

A lag of interest continued in the merchandising of nonfat dry milk under official identification in the first half of the 1960 decade. In 1966, problems with salmonella bacterial contamination surfaced, and this sparked a renewed interest in the grade labeling of instant nonfat dry milk for household use.

The Inspection and Grading Branch, Dairy Division, immediately developed a Salmonella Surveillance Program and played a leading role in encouraging the instant nonfat dry milk industry to improve its product by adoption of the USDA inspection and grade labeling program.

Instant nonfat dry milk marketed under the USDA trademark had to be produced in a plant that had first been Federally inspected and approved. Also, the instant nonfat dry milk had to be processed and packaged under the continuous surveillance of a USDA resident grader, who made certain that the product was free from harmful bacteria and met other exacting laboratory tests for grade requirements. To earn the "U.S. Extra Grade" shield, instant nonfat dry milk had to have a sweet and pleasing flavor and a natural color. In addition, it had to live up to its name--that is, dissolve instantly when mixed with water.

In 1972, the grade shield was modified to cover nonfat dry milk graded, processed and packed under USDA inspection.

The Borden Company, New York City, was the first organization, after the Salmonella scare, to make application to package instant nonfat dry milk using the USDA trademark-quality control shield at its Dixon, Ill., plant in Jan. 1967. They continued the use of the official shield until July 1969.

The Kroger Company, Cincinnati, Ohio, was the next organization to package officially identified instant nonfat dry milk, starting in July 1967 and continuing to Feb. 1974.

Pet, Inc., St. Louis, Mo., began merchandising instant nonfat dry milk under the USDA shield in May 1971 and has continued to the present time.

Grand Union Company, East Paterson, N.J., entered the program in May 1973 and is currently merchandising the officially labeled product.

Alba Foods (a Division of Weldon Farm Products, Inc., New York City) had its application and packaging materials approved to distribute officially identified instant nonfat dry milk and started marketing the product in Jan. 1976.

The total volume of instant nonfat dry milk marketed under the USDA trademark during the past 9 years has varied from 5 to 25 million pounds annually, the latter figure being reached in 1973.

The principal organizations who manufacture and/or distribute or merchandise instant nonfat dry milk without the USDA trademark require that the base powder be manufactured under the USDA resident grading program and meet certain prescribed specifications evidenced by an official grading certificate.

A few firms distribute instant nonfat dry milk, packed in bulk containers, stamped with the official U.S. Extra Grade shield.

Associated Milk Producers, Inc., Mason City, Ia., began the distribution of such a product in Aug. 1974 and Alba Foods, New York City, in Nov. 1975.

MISCELLANEOUS DAIRY PRODUCTS

The first miscellaneous dairy product to be produced and marketed under an official inspection legend was sterilized milk. To qualify for the USDA official identification, the raw milk had to be of high quality and processed and canned in an approved plant under resident inspection. The end product was subjected to organoleptic examination and laboratory tested.

The first organization to utilize such service was Med-O-Milk, Inc., East Stanwood, Wash.¹⁴ The individual consumer-size cans of sterilized milk carried the USDA inspection shield for a short period of time--from March 1952 to June 1953.

The second organization to qualify for and utilize this service was the International Milk Processors, Inc., Ridgeland, Wis. The operation was likewise short-lived, continuing from June 1952 to Sept. 1953.

The third organization to participate in the program was the Real Fresh Milk Company, Visalia, Cal. The sterilized milk from this plant carried the USDA official identification from Oct. 1952 to Feb. 1964.

The fourth and only other organization to participate in the program was the Cass-Clay Cooperative Creamery, Moorhead, Minn., from July 1953 to July 1955.

The first organization to utilize the program of manufacturing and distributing cottage cheese under official identification was the Cass-Clay Cooperative Creamery. The inspection shield was first placed on cottage cheese manufactured at this plant, under the resident and quality control service program in Sept. 1953 and has continued ever since.

The second and only other organization to participate in the program was Grandview Dairy, Inc., Cohocton, N.Y., from Nov. 1961 to Jan. 1966.

¹ Letter from Edward Small to Roy C. Potts, June 13, 1938, requesting approval of the introduction of the keeping-quality test for butter to be packaged with certificates of quality.

² 6 F.R. 3622.

³ 20 F.R. 5622.

⁴ 11 F.R. 7932.

⁵ 20 F.R. 5622.

⁶ 37 F.R. 22363.

⁷ 20 F.R. 5622.

⁸ Office records. Available in Poultry and Dairy Quality Division, FSQS, USDA.

⁹ Ibid.

¹⁰ Ibid.

¹¹ Ibid.

¹² Ibid.

¹³ This section is based upon records available in the Poultry and Dairy Quality Division, FSQS, USDA.

¹⁴ This section is based upon records available in the Poultry and Dairy Quality Division, FSQS, USDA.

SURVEY PROGRAM FOR DAIRY PLANTS

Most consumers want wholesomeness in their dairy products, plus "eating quality" and product stability. They want to be certain that the products were produced under sanitary conditions.

Such assurance for dairy products has been available to the dairy industry and hence to the general public through a voluntary plant survey program offered by the Inspection and Grading Branch, Dairy Division, Agricultural Marketing Service (now the Poultry and Dairy Quality Division, Food Safety and Quality Service).

Some inspections of dairy plants, conducted from the mid-1930's through the 1940's, were handled on a selective and limited basis. They were performed mainly to assist plants in quality improvement to attain a uniform level of U.S. Grade A or U.S. Grade AA butter, and to assist plants that were having problems with product stability, such as protein decomposition.

Systematic inspection of dairy products manufacturing plants became an integral part of the inspection and grading service in 1951. Initially, one of the main concerns was to ascertain which dairy plants were ineligible for official grading service. The plants were classified as to: "full status," "probational," and "unsatisfactory." The dairy plants classified as "unsatisfactory" were ineligible for official grading service until the deficiencies were corrected as evidenced by a subsequent survey. Those dairy plants which received a "probational status" were reinspected within a limited time to check for correction of the deficiencies. "Full status" plants were fully eligible for the grading services of the Branch and inspected on a yearly basis.

Basically, those early surveys concerned the dairy plants manufacturing butter, nonfat dry milk, and Cheddar cheese. These products were eligible for dairy price support programs at shipping point or at the wholesale market level. The products were purchased in accordance with Commodity Credit Corporation specifications, which required that offerings be made of a specific U.S. Grade; the manufacturing plants were subject to USDA inspection and approval. Products made in a plant found to be using unsatisfactory manufacturing practices, equipment or facilities, or operating under insanitary conditions, were not acceptable.

Part of the impetus for the surveys of the early 1950's stemmed from lack of product stability in some of the storage stocks held by the Government under the price support purchase program. One of the serious problems, for instance, was infestation of the containers of nonfat dry milk with dermestid insects (common to stored grains). Follow-up inspection of the plants making the nonfat dry milk almost invariably revealed infestation of the same species of the insect in the powder manufacturing or storage area or in the supply room for the container liners. In fairness to the seller, the Government introduced for the first time, a "limitation on seller's liability" commencing with purchase Announcement LD-21, dated Apr. 1, 1956.¹ This Announcement

stipulated that if the seller had his plant inspected at least every 3 months by USDA at his expense, and if the plant was approved by USDA as a result of such inspections, any milk found after delivery to be insect-infested would be conclusively presumed to have become infested from other sources after delivery, provided that such milk was produced and delivered during the period between such inspections. Plant approval under this arrangement was based on a satisfactory history of: freedom from insect infestation, proper construction of plant and warehouse facilities, and conduct of plant operations under satisfactory sanitary conditions. After a plant was approved, the seller would apply for periodic plant inspection service. This provision remained in effect through Announcement PS-Da-10, dated Nov. 1, 1966.² This Announcement was operative through Mar. 31, 1968. By that time the insect problem was actually brought under control and virtually eliminated. The Agricultural Stabilization and Conservation Service, USDA, announced that after Dec. 31, 1965, they would purchase only nonfat dry milk in bags having closures sealed with a tape; this afforded additional protection against insects.

Although the nonfat dry milk plant surveys of the early 1950's focused primarily on dermestid insect control, their scope was gradually expanded to include checks on housekeeping, condition of equipment, and sanitation.

Likewise, in the butter industry, the early surveys were primarily linked to USDA experience with price support butter stocks. Instances of moldy, putrid, cheesy, or similar kinds of progressive deterioration were followed by inspection of the manufacturing creamery. Initial emphasis was placed on the production factors which affected stability of butter quality: cream quality, proper pasteurization, wash water (contaminated well-water), good condition of equipment, good manufacturing and sanitation practices, and proper treatment of butter liners.

Cheese factory surveys were also started in the early 1950's. These were fostered to promote correction of plant operating practices which caused serious defects in stored cheese. Primary emphasis was on: mite control, formation of a sound rind on the cheese before paraffining, elimination of copper-exposed equipment, good sanitation practices, and good "make" procedures. Inspection of cheese factories posed a big logistics problem, particularly in the State of Wisconsin. At that time, Wisconsin alone had about 1,800 cheese factories.

Of course, in most instances deficiencies at the dairy manufacturing plants were discovered before the product was offered for sale to the Government under the price support program. In those instances necessary corrections were made--as revealed by reinspection--and the product was then eligible for offering to the Government. Plant survey inspection was not mandatory, but the plants were subject to USDA inspection.

The plant manager received a typed report of the plant survey, accompanied by a letter. Not only were deficiencies and recommendations listed, but improvements since the last survey were also acknowledged. The fee was based on time consumed in making the survey, travel time, and any expenses involved.

Much experience was gained in plant survey work in the 1950's; this laid the groundwork for a more detailed and sophisticated program in the 1960's and 1970's. Part of this improvement resulted from the development of the "General Specifications" formulated by the Standardization Branch and the "Guidelines" elaborated by the Inspection and Grading Branch, and also through the expanded 3-A Sanitary Standards program for dairy equipment and related processing practices.

Survey report forms were developed and instructions for each type of product operation were furnished to each of the survey inspectors, to guide them in the proper interpretation and implementation of the requirements.

The survey program was developed under the national leadership of B.J. Ommodt, Chief, Inspection and Grading Branch; it remained under his general direction until his retirement in the summer of 1959. Harold E. Meister, who had served as assistant to Ommodt for many years, was appointed Chief and guided the program from then until the spring of 1968, when he became a Deputy Director of the Dairy Division with overall administrative responsibility for the standardization and inspection and grading activities. At that time Edwin F. Garbe, assistant to Meister, was appointed Chief.

USDA APPROVED PLANTS

In the early 1960's, the plant survey concept took a different twist. The emphasis was placed on the positive, rather than on the negative, approach. Starting in 1963, the basic program of the Inspection and Grading Branch centered on the nationwide plant survey operation, which catalogued those plants approved for USDA inspection and grading service. The qualifying dairy processing plants were surveyed once a year, and listed semi-annually in the publication entitled "Dairy Plants Approved for USDA Inspection and Grading Service," AMS-509, dated July 1963. In July 1964, the "USDA Approved" listing was identified as AMS-539, and in Jan. 1966 the practice of assigning a number to the publication was discontinued. Commencing with Oct. 1969, the publication has been issued on a quarterly basis.

The surveys are conducted, unannounced, by experienced and highly trained dairy inspectors. Most of the plant survey inspectors are employees of the Inspection and Grading Branch; however, some are State Department of Agriculture employees regularly engaged in dairy inspection work, who are licensed and supervised by USDA.

USDA approval qualifies the plant to use the many services provided by the Inspection and Grading Branch; these include sampling, grading, testing, and certification of products. Such service is limited to products emanating from inspected and approved manufacturing operations of the plant. Plant approval does not constitute endorsement of quality unless the product has been inspected and meets the U.S. grade standards or other quality specifications of buyer or seller.

The procedures for performing the surveys are based on requirements initially published in 1948 and revised in 1955, 1967, and 1976.

At the time of the plant survey, the inspector contacts the manager or employee in charge at the plant to inform him of the purpose of the visit. Arrangements are made to have someone assigned to accompany the inspector and to assist with equipment dismantling, and to take notes of any deficiencies which might be observed.

The plant survey inspector makes detailed checks on more than 100 items; some of these are described below.

- The plant surroundings must be kept clean and orderly. No rubbish or surplus equipment should be stored near the plant and adjacent areas, since these may serve as breeding grounds for insects and rodents.
- Checks for proper lighting are made with a light meter in the raw milk grading and receiving area, the manufacturing areas, and the warehouse. Maintenance of high level operations, good housekeeping, and effective cleaning operations require sufficient lighting.
- Plant facilities should be soundly constructed and kept in good repair. All outside wall openings must be properly protected to prevent the entrance of rodents and insects.
- The incoming raw product should be regularly tested for quality as it comes into the plant.
- An overview of the general quality of incoming milk is determined by the use of "sani-guide" discs, with emphasis on detecting the extent of extraneous matter.
- Milk wholesomeness is evaluated by means of the direct microscopic clump count. Samples of the plant's commingled milk are selected by the inspector for use in preparing microscopic slides. The slides are sent to the Dairy Division laboratory for analysis.
- All processing equipment must be kept sanitary and in satisfactory condition. The inspector arranges for equipment dismantling and checks for condition and cleanliness.
- The packaging techniques used in filling product containers are checked to assure that sanitary procedures are followed. The containers must provide maximum protection to the product.
- The plant must have an adequate laboratory testing program to assure that satisfactory control is maintained for the production of wholesome finished products (49, p. 14).

Each survey is tailored to the kind of manufacturing and processing involved--cheese, butter, or nonfat dry milk. For example, in the manufacture of dry milk, the source of air supply for the drying, conveying, or cooling of the milk powder must be free from objectionable odors, smoke, and extraneous matter. Air must be filtered before coming into contact with the product.

The inspector meets with the plant manager to review the results of the survey. If serious deficiencies exist, he explains what steps should be taken before approval can be granted. When improvements are made, the inspector makes another survey to determine if approval can be granted. Once approved, a plant does not automatically keep its status. A similar survey has been required, since Jan. 1967, at least twice a year to maintain this eligibility; more frequent surveys--every 90 days--are made of plants manufacturing nonfat dry milk and other dried dairy products.

SALMONELLA SURVEILLANCE PROGRAM

In the mid-1960's, a variety of processed foods and drugs were implicated in outbreaks of salmonellosis: egg products, dry milk, coconut, inactive dry yeast, carmine dye, and thyroid powder. Salmonellosis is an infection caused by bacteria of the genus *Salmonella*.

The problem of controlling salmonellosis in man is greatly complicated because of the widespread distribution of the organisms in the environment, and the many ways they can reach the host. (2, p. 2)

When *salmonella* was first reported in nonfat dry milk in early 1966, the Inspection and Grading Branch, Dairy Division, C&MS, immediately launched a *Salmonella* Study to determine the extent of the problem, to ferret out the trouble spots or the points of potential contamination, and to determine what corrective measures were needed. Controls and procedures were established to prevent contamination of products during processing and packaging so as to establish confidence in the product and to provide consumer protection. A *Salmonella* Surveillance Program was then devised to measure the effectiveness of the corrective measures and became an integral part of the plant survey program in Jan. 1967.³

Joseph A. Rubis, Assistant Chief of the Inspection and Grading Branch, was the main architect in developing the study and in the formulation of a well balanced *Salmonella* Surveillance Program which includes testing product samples and environmental material.

The product samples are taken with a sterile spoon, at different times of the production run, from each of 3 day's production, with four samples selected for a total of 12 samples. One-half pound of the product is placed in each sample bag. The laboratory composites the four samples for each day for testing, making a total of three composites--400-gram composites made up from four 100-gram samples.

Three environmental samples are collected in polyethylene twirl sample bags, using a separate sterilized spoon for each sample. These samples are individually tested. The standard procedure is to take samples from the filter for cooling air, tailings (oversized material from sifter), and vacuum cleaner material. In addition, samples are sometimes taken from encrusted material on equipment, material from sewer drains, the roof, and the like.

The Food and Drug Administration, through its District Offices, conducted nine Salmonella workshops, from Dec. 1966 through Mar. 1967, in cooperation with the American Dry Milk Institute, State Food and Drug Officials, State Universities, United States Department of Agriculture, and the United States Public Health Service. Robert G. Semerad, Supervisor of Survey Programs, Inspection and Grading Branch, Dairy Division, Consumer and Marketing Service, Chicago Region, helped FDA plan the workshops and appeared on the program of each of the nine workshops. They were attended by 175 to 200 persons seeking an understanding of others' views and approaches.

Semerad's presentation was related to USDA's Salmonella Surveillance and Plant Survey Program. In Apr. 1967, he also discussed the Salmonella problem at the University of Minnesota Short Course.

Upon discovery (1966) that Salmonella could be a bacteriological problem in dry milk products, there was considerable speculation that the organism might originate in the raw milk supply, either from infected cows or other farm-based contamination. As a reaction to this possibility, a decision was made to require pasteurization of fluid products with "3-A" equipment and procedures at a point just prior to the evaporator. Similar repasteurization would be required at the drying plant for condensed products originating from other plants. These requirements were announced to the dry milk industry in a memorandum dated June 10, 1966, sent to managers of dry milk plants. Industry response was excellent and the additional pasteurization controls were rapidly installed. Beginning Mar. 1, 1967, compliance with the pasteurization requirement became mandatory for plant approval.⁴

Subsequent experience showed that Salmonella presence in dry milk products is a post-pasteurization problem, and does not originate from the raw milk supply. Nevertheless, the required pasteurization treatment has been helpful in narrowing down the possible sources of contamination and in directing plant control efforts. It also permits pasteurized labeling of dry milk products made in USDA approved plants, with the additional level of product safety inherent in that process.

The Dairy Division's control system and surveillance program was recognized by the Food and Drug Administration and a Memorandum of Understanding was agreed upon May 9, 1968, between FDA and USDA, so as to minimize duplication of inspection and testing work.

On July 12, 1967, it was announced that the National Academy of Sciences was undertaking a broad study of Salmonella and its impact on human health, food technology, and animal agriculture in the United States. The project, an 18-month study, included a survey of the problem of Salmonella contamination in the food and agricultural industries, the chain of infection that leads to outbreaks of salmonellosis in man, and the effectiveness of then current control methods.

A comprehensive report, "An Evaluation of the Salmonella Problem," prepared by the Committee on Salmonella, Division of Biology and Agriculture,

National Research Council, was issued in 1969. The findings and recommendations in this report substantially supported the Salmonella control and Surveillance Program of the Dairy Division, Consumer and Marketing Service, USDA.

QUALITY SURVEILLANCE ON COMMINGLED MILK

In early 1967, a study was launched to determine the practicality of relating the quality of raw whole milk in storage tanks to plant status. The direct microscopic clump count (DMCC) method was used to determine the bacterial estimate of the milk. Samples of commingled milk were taken from plant storage tanks. Slides were prepared and mailed to the Chicago laboratory for the required staining and microscopic work.

After a period of about 2 years of official DMC testing for information purposes, a memorandum was sent on Mar. 27, 1969, to plant managers informing them that USDA was planning to step up its efforts toward quality improvement of manufacturing grade milk. The managers were advised that since Sept. 1968, representatives of the Dairy Division had talked to State officials and industry leaders in over 25 major manufacturing milk producing States, discussing the importance of increased efforts in this direction. They were also told that the Inspection and Grading Branch inspectors were instructed to include in their plant survey reports the information about the DMCC of commingled milk in the plants' storage tanks. The USDA General Specifications provided that the DMCC should not be over 3 million per ml. In addition, the inspectors were instructed to check the quality records of producers' milk and the plant's program of field service to producers whose milk did not meet minimum quality requirements.

A quality surveillance program on the plant's commingled milk supply was implemented June 1, 1971, as an integral part in the assignment of plant status under the USDA plant survey program.⁵ Instructions were issued requiring probationary plant status when two of the last three DMC averages exceeded 3 million, and requiring ineligible plant status when the results greatly exceeded 3 million. The actual limits applicable for probationary and ineligible plant status have often been lowered to reflect average plant capability as determined by yearly DMC performance statistics.

The test results are reported to State regulatory officials for follow-up work with producers to improve milk quality.

SURVEY GUIDELINES

In the spring of 1968, Edwin F. Garbe assigned responsibility to Roy F. Hedtke for the development of Guidelines (an updating of Instructions) for the plant survey inspectors. Draft Guidelines were formulated and after ample application were finalized in the spring of 1969. The Guidelines are designed to implement the provisions of the General Specifications as they relate to the survey report form, to assist the plant survey inspectors to interpret the requirements uniformly, and to foster uniform evaluation of plant performance. This evaluation determines whether the plant qualifies for USDA inspection and grading service. The Guidelines were issued as DA Instruction No. 918-70, on Apr. 1, 1969.

The plant survey report form which evolved in the 1950's consisted of a lengthy checklist of items, a "comments and remarks" section, and a "recommendations" section. The latter two sections were to be prepared in essay style by the inspector. In other words, deficiencies were fully described in the section of the report where they were encountered; recommendations for correction were prepared at the end of the report. As plants became larger and more complex, the reports followed the same trend. In 1973, Harold K. Linden, regional supervisor, Minneapolis region, recommended revision of the form and method of preparation, and the omission of the detailed description of observed deficiencies. A trial use of the concept elicited a positive response from plant managers as well as inspectors. Accordingly, seven new survey pages DA-151 to DA-151-6 were added to the new format. They were put into use in late 1975, and used until Feb. 1977, when they were replaced with twelve newly revised report pages, DA-151 to DA-151-11, examples shown in Appendix D. The purpose of the revision was to incorporate changes of the newly revised (Jan. 2, 1976) General Specifications and to supply "sets" with inserted carbons to facilitate typing.

The inspector does not use all 12 pages of this section for each survey: pages A and Z are standard, plus whichever of the other pages are needed to cover the particular operation. The new format has been well received.

The USDA survey report not only shows what is wrong with a dairy operation; it also shows specific recommendations for corrections. It has a separate listing of corrections and improvements made since the previous inspection. These features, plus the evident personal attention given to plant problems by the inspector, are considered important to the success of this survey work.

CODE SYSTEM FOR IDENTIFYING PRODUCTS, PROCESSING OR PACKAGING OPERATIONS

Starting with the July 1972 issue of "Dairy Plants Surveyed and Approved for USDA Grading Service," a code system replaced the system of showing the products eligible for USDA grading or inspection service, and the processing or packaging operations which meet USDA requirements for facilities and sanitation.

The service covers five butter and butter products; forty-three cheese and cheese products; nine dry milk products; nineteen milk and dairy products; thirty-three specialty products; and eighteen packaging and processing operations.

NATIONAL TRAINING CONFERENCE

Once a year the Inspection and Grading Branch conducts a national training conference at a central location; at this time many of the current problems and procedures relative to the resident and plant survey programs are presented for a thorough discussion. In addition, local dairy processing plants are visited to conduct on-the-spot demonstrations.

The conference format varies from year to year, as do program leaders, speakers, and panel participants. In addition to Washington staff personnel, assignments are given to regional supervisors and resident graders. Outside experts present special subjects.

With respect to the resident program, the problems and procedures covered may focus on: grading procedures and grading clinics for butter, cheese, and dry milks; sampling and condition of containers based on statistical techniques; laboratory tests as a function of quality control, moisture and butterfat testing on a number of dairy products, and testing for scorched particles in dry milks; sources of error in laboratory analysis and statistical analysis of monthly laboratory comparisons; sanitation problems, review of requirements for cleaning of dairy equipment, including C-I-P equipment; pasteurization; critical points in plant processing; testing for penicillin and salmonella; preparation of slides for DMCC test on commingled milk; grade labeling requirements; and preparation of reports.

The problems and procedures of the plant survey program may be centered on: bulk milk testing for coarse extraneous material; testing for abnormal milk; proper handling and transportation of whey; whey pasteurization, condensing and processing; cleaning of continuous churning; automated clean-in-place procedures; review of continuous cheese-making equipment; ultrafiltration and reverse osmosis; safety considerations in making plant surveys; review of General Specifications; review of guidelines in making plant surveys; guidelines for inspecting margarine plants; and preparation of plant survey forms.

As a further step to help the proper interpretation and implementation of the General Specifications and use of the plant survey form, the regional supervisors hold periodic supplementary training sessions, for the benefit of the survey inspectors in their respective regions. These include State Department of Agriculture inspectors. Although such scheduled local and national training meetings are helpful in standardizing the survey procedures, the primary method of training is the tried and proven "one-to-one approach," the personalized instruction and training from a capable and experienced supervisor who works with the inspector on the job. Such training is routinely scheduled by the regional supervisor and his staff.

Most of the plant survey work is conducted by licensed inspectors of the Inspection and Grading Branch with some conducted by State Department of Agriculture employees licensed by USDA.

GENERAL ACCOUNTING OFFICE AUDIT

In 1970, the General Accounting Office (GAO) conducted a review of the Inspection and Grading Branch's plant inspection program. The main thrust of the review was to evaluate the effectiveness of the USDA plant inspection program.

For their survey, the GAO randomly selected 16 dairy manufacturing plants located in Kansas, Missouri, Nebraska, and Oklahoma. The review began with the survey of six Missouri plants and continued with two plants in Kansas, five in Nebraska, and three in Oklahoma.

Harold K. Linden, who was then assistant regional supervisor for the Minneapolis area, accompanied the GAO inspectors during the entire review. While GAO observed some conditions where improvement in sanitation were needed, its impression was that enforcement of sanitation by the Minneapolis office of the Dairy Inspection and Grading Branch was excellent.⁶

RECOGNITION OF PLANT SURVEY PROGRAM

The plant survey program is recognized by dairy plant managers as an important means for improving and maintaining sound operations and as a constructive force in assuring the production of wholesome, uniform high quality products, with good keeping properties. Many buyers use the "USDA Approved" plant listing as a guide to sources of supplies of dependable quality dairy products manufactured under rigid sanitary requirements.

When the survey program, as we now know it, was inaugurated in 1963, about 12,000 copies of each "USDA Approved" plant listing were distributed upon request to the dairy industry, buyers, brokers and users of dairy products.

The July 1963 issue listed 1,346 dairy plants, located in 40 States, as enjoying official inspection and grading service. In addition, 154 dairy plants which were surveyed did not qualify for inspection or grading service. There has been a gradual reduction in the number of dairy processing plants engaged in the survey program. In 1976, about 1100 dairy plants participated. This figure has held up remarkably well, considering the drastic reduction in the number of dairy products manufacturing plants during the past 13 years. About 75 percent of all manufactured dairy products are covered by this voluntary survey program.

Some noteworthy examples of the status and recognition of USDA Plant Survey Program are as follows:

1. Effective Apr. 27, 1968, USDA's meat and poultry inspection program required that all dry milk products used in processed meats originate from USDA approved plants.⁷ The packages of dry milk are required to bear an appropriate inspection mark to enable the inspector at the processed meat plant to make a proper identification.
2. Effective Jan. 1, 1970, the Department of Defense started using the list of Dairy Plants Surveyed and Approved for USDA Grading Service and discontinued its own inspection of these plants.⁸
3. On Jan. 26, 1972, USDA and FDA announced the signing of a Memorandum of Agreement whereby FDA would recognize USDA's plant inspection and Salmonella surveillance on dry milk plants. The agreement and exchange of information is intended to minimize duplication of efforts.
4. In Oct. 1970, Herb Riehl, newly appointed Canadian Dairy Plant Registration Coordinator, spent a week with Inspection and Grading Branch personnel to become familiar with the operation of the USDA Plant Survey Program,

preparatory to the establishment of a stronger national program in Canada. In addition, Roy F. Hedtke illustrated the implementation of the Branch's program by completing two plant inspections with Herb Riehl at dairy plants in the immediate Washington area. All of this was an outgrowth of the joint inspection of Canadian plants in the spring of 1969, using inspection procedures, inspection forms, and regulations of the Inspection and Grading Branch.

On Aug. 28, 1973, Ken Savage, Director, Production and Marketing Branch, Dairy Division, Canadian Department of Agriculture, visited the Washington office and reviewed his country's new dairy plant inspection program. Although their new inspection criteria and procedures were molded after the USDA program, the implementation of the Canadian program has been cooperatively handled by the Federal, Province, and Industry sectors; the Provinces having the responsibility of the day-to-day enforcement of the program.

On Nov. 14, 1973, Herb Riehl headed a team of dairy specialists who presented an overview of their progress in developing a federal quality package for the Canadian dairy industry. The Canadians acknowledged the constructive assistance given them in 1969 and 1970 by the Dairy Division, Consumer and Marketing Service, USDA.

5. Kenneth R. Olson, Chicago Regional Supervisor, met on Aug. 26, 1974, with Messrs. Meany and Swanson of the Chicago Board of Health, who expressed concern about the increased use of condensed and dried whey in Grade A products in the metropolitan market. The Chicago Board of Health desired to avoid duplicating the Inspection and Grading Branch's survey work; they wanted to explore the USDA involvement in inspecting whey products used for human food.

Olson explained USDA inspection procedures, criteria, approved plant program, and expertise of Inspection and Grading Branch personnel in the field of manufacturing grade milk products. As a followup on the discussion, it was arranged for one of the Chicago Board of Health inspectors to accompany Robert Aschebrock, plant survey inspector, on a routine inspection of a whey plant operation in Wisconsin.

In Jan. 1975, the Chicago Board of Health announced that dry whey emanating from USDA full status plants would be acceptable for use in ice cream and other foods in Chicago.

¹ U.S. Commodity Stabilization Service, Livestock and Dairy Division. Purchase of Dairy Products. Announcement LD-21, Apr. 1, 1956. Available in Poultry and Dairy Quality Division, FSQS, USDA.

² U.S. Agricultural Stabilization and Conservation Service, Livestock and Dairy Division. Purchase and Sales Dairy Products. Announcement PS-Da-10, Nov. 1, 1966. Available in Poultry and Dairy Quality Division, FSQS, USDA.

³ Memorandum to Managers of Milk Drying Plants. Dairy Division, C&MS, Jan. 10, 1967. Available in Poultry and Dairy Quality Division, FSQS, USDA.

- ⁴ Notice to Managers of Milk Drying Plants. Dairy Division, C&MS, Apr. 13, 1966. Available in Poultry and Dairy Quality Division, FSQS, USDA.
- ⁵ Memorandum to Managers of Dairy Manufacturing Plants, Dairy Division, C&MS, Apr. 9, 1971. Available in Poultry and Dairy Quality Division, FSQS, USDA.
- ⁶ Office records. Available in Poultry and Dairy Quality Division, FSQS, USDA.
- ⁷ 33 F.R. 5087.
- ⁸ The balance of this section is based upon records available in the Poultry and Dairy Quality Division, FSQS, USDA.

LABORATORY SERVICE

The first laboratory service rendered by the Division of Dairy and Poultry Products, Bureau of Agricultural Economics, started in the fall of 1934, when the Government purchased large quantities of evaporated milk for relief distribution. The evaporated milk, tendered for delivery on a contract basis, was sampled by USDA licensed inspectors and examined and analyzed in Chicago and San Francisco. Arrangements were made with the Food and Drug Administration, at that time a unit of USDA, to utilize a part of its laboratory facilities at the New Post Office Building in Chicago. The Bureau of Dairy Industry, USDA, loaned Joel Winkjer and Charles S. Trimble to analyze the evaporated milk samples in Chicago.¹ In 1935, the evaporated milk was analyzed by Asher A. Beck. The organoleptic examination was handled by Edward Small in 1934 and By Clarence L. Pier in 1935.²

Arrangements were also made to utilize the laboratory facilities at Golden State Company, Ltd., San Francisco, for the examination and analysis of the evaporated milk samples shipped to that location from nearby plants. Byron H. Webb, staff member of the Bureau of Dairy Industry in Washington was detailed to handle that assignment.³

The Government also purchased nonfat dry milk in early 1935, for relief distribution. A contract was negotiated with the American Dry Milk Institute, Inc., Chicago, Feb. 1, 1935, for the purpose of utilizing its facilities and laboratory technicians for the grading of the nonfat dry milk (then called dried skim milk).⁴ ADMI laboratory personnel were licensed by USDA to carry on the grading work in accordance with purchase specifications, which required among other things that the product meet the ADMI standards for Extra Grade (the first USDA grade standards for this product were published in 1943).

The Government also purchased very large quantities of nonfat dry milk during World War II and the grading was handled at the ADMI laboratory, for over two years, utilizing ADMI personnel. In addition, laboratory technicians of the Division of Dairy and Poultry Products were assigned to the ADMI laboratory.

USDA OPENS CHICAGO LABORATORY

The laboratory facilities of the Food and Drug Administration were again utilized for the testing of evaporated milk samples in 1940 and early 1941. The available facilities were soon found inadequate to handle the analytical requirements and the Division of Dairy and Poultry Products established its own laboratory at the Customs House Building, Chicago, in May 1941.⁵ Allen Perry was employed to take charge of the analytical work and Edward Small was assigned administrative responsibility of the laboratory operation until Perry resigned in March 1942.

In May 1942, Orme J. Kahlenberg was employed as Chemist-In-Charge of the entire laboratory operation. For the first few years the analytical work on dairy products consisted of testing cheese (natural and pasteurized process), evaporated milk, sweetened condensed milk, Carter's Spread, butteroil; and nonfat dry milk and dry whole milk (starting in Jan. 1944), mainly for delivery to the Government under the lend-lease program and other programs related to the war effort.

The laboratory was moved to the Mallers Building, 5 South Wabash Avenue, Chicago, in early 1943. In Jan. 1944, arrangements were made to transfer the grading of nonfat dry milk and other dry milk products from the American Dry Milk Institute laboratory to the USDA laboratory.⁶ In early 1946, the laboratory was relocated to 1819 W. Pershing Road, Chicago. It moved back to the Customs House Building in Feb. 1975.

The Chicago laboratory, while primarily designed, equipped and organized for service activity, has over the years functioned in many corollary areas. The service activity consists of analytical and quality control tests, including chemical and bacteriological determinations essential in evaluation of class, quality, and grade; for example, assignment of a U.S. grade to nonfat dry milk requires seven objective laboratory tests and a flavor test.

The workload of the Chicago laboratory decreased markedly immediately after World War II. It was feared, however, that the war's aftermath would bring a burdensome surplus of agricultural commodities and with it a depression of agricultural prices. This fear, based upon price precedent established after World War I and upon agriculture's production capacity proved during World War II, seemed by 1948 to have been confirmed. There were burdensome surpluses, and agricultural prices dropped sharply. This resulted in Government purchases, under the price support program, of dairy products and other agricultural commodities. The volume of inspection and grading and laboratory work increased substantially, particularly on nonfat dry milk and Cheddar cheese.

Kahlenberg resigned in Oct. 1947 and for over a year the laboratory was without a permanent Chemist-In-Charge. Robert T. Corley was placed in charge of the laboratory and remained in that capacity for the remainder of 1947 (8, p. 16). Edith I. Litt was assigned technical responsibility for the laboratory operation from Jan. 1948 through Apr. 1949. During the latter period, Edward Small again assumed administrative responsibility for the laboratory activities. In May of 1949, Theodore I. Hedrick was appointed as Chemist-In-Charge and continued in that capacity through Dec. 1955 (18, p. 6).

During Hedrick's regime the laboratory facilities were materially improved with better lighting, installation of air conditioning, and additional laboratory equipment for increasing the variety of tests utilized for composition and quality improvement.⁷ He obtained greater efficiency in the use of personnel through procurement and use of labor saving devices such as Gramatic balances, liquid dispensers, electric shakers, an intercom system, and many other improvements. Hedrick revised and improved the USDA methods for grading and inspection of manufactured dairy products, such as dry milk and evaporated milk.

In conjunction with field service, he promoted the use of "line" tests for greater product stability evaluation, especially butter, and assisted with the establishment of line test standards. He worked with and encouraged State officials in the development of this program. Hedrick assisted with the establishment of laboratory service at plants utilizing the resident grading and quality control service program, and assisted with the development of the requirements for the supervision of weighing of milk and sampling and testing of producers composite milk samples. He improved the confidence of industry in the performance of the Chicago laboratory. The requests increased materially from industry for aid and advice on processing, keeping quality, storage, packaging, quality, and composition control problems.

Hedrick developed a survey form for checking plant laboratories employing USDA resident grading and quality control service. He supervised a number of development projects, such as: a more rapid copper test on butter, cheese, and dry milk; keeping-quality studies on butteroil and instant nonfat dry milk; a cryoscopic study on the effect of processing on the freezing point (adulteration) of canned sterile whole milk, moisture resistance of various type household packages of nonfat dry milk, density test for nonfat dry milk, and a USDA method for the determination of color in egg products.

The Chicago laboratory participated in an 18-month cooperative project with the Bureau of Dairy Industry, devised by C.J. Babcock and D.R. Strobel of the Standards Section, which got underway in late 1952, to determine the moisture resistance of various types of household packages then being used for the marketing of nonfat dry milk.⁸ Samples were removed from storage monthly for testing. The samples were tested for moisture content, solubility index and flavor at the outset of the project and at the monthly intervals.

The findings were discussed with representatives of the companies that submitted the packages. This study assisted the packagers and industry in developing more suitable packages for this purpose.

A problem arose with product stability of pasteurized process Cheddar cheese packed in No. 10 tins (7 pounds of cheese) distributed by CARE in Egypt and Greece in the fall of 1955, involving quality deterioration and bulged cans. A study was immediately set up by Joe Rubis involving keeping-quality testing of canned process cheese, including some of the product distributed in Egypt.⁹ Samples were incubated at 70°F. and 98°F. for 6 months to determine chemical and bacteriological changes. Laboratory analyses did not reveal any apparent deficiency in processing and, despite the inability to isolate gas forming organisms, it was concluded that the cause of spoilage was probably of bacterial origin. The experiment indicated that the keeping quality of the cheese when held at high temperatures might be improved by lowering the pH of the cheese to 5.4 and increasing the cooking temperature from 158°F. to 165°F. and holding for at least 30 seconds. These recommendations were accepted for future processing contracts.

Jim L. Dizikes succeeded Hedrick in Feb. 1956 and has held the position as Chemist-In-Charge ever since (9, p. 22). He worked as a chemist in the Chicago laboratory during World War II. He was soon a member of a team that investigated the food-poisoning episode related to Government-owned nonfat dry milk shipped to Puerto Rico and the Virgin Islands in the summer of 1956.

The Chicago laboratory under his direction played an important role in two collaborative studies relating to the reliability of the direct microscopic clump count tests as a means of evaluating the quality of nonfat dry milk. One of the studies was conducted in 1957 and 1958 and the other in the early 1960's. The experimental design for the first collaborative study was developed by the Statistical Standards Division, AMS, the Standardization and Program Development Branch, Dairy Division, AMS, and the Chicago laboratory.

Under the direction of Dizikes, the laboratory prepared seven lots of nonfat dry milk, each at a different bacterial level. Each of 26 participating laboratories was visited by a representative of the Chicago laboratory before samples were sent. The technician discussed the project and determined the extent of training and experience of the technicians and the equipment and facilities of the individual laboratories.

The second collaborative study was a joint project with the American Dry Milk Institute; ADMI developed the experimental design, which was concurred in by Statistical Standards Division and the Standardization and Program Development Branch.

PRODUCTS TESTED AND TESTS¹⁰

Some of the products that are (or have been) tested by the Chicago laboratory include: butter, butteroil, anhydrous milkfat, ghee, Carter's Spread, nonfat dry milk, instant nonfat dry milk, dry whole milk, dry buttermilk, dry whey, dry casein, caseinates, lactose, dry malted milk, dry ice cream mix, dry cream substitute, cream, plastic cream, sour cream, evaporated milk, sweetened condensed milk, sterilized milk, sterilized cream, sterilized cream topping, natural cheese, pasteurized process cheese and related products, corn-soya-milk, liquid eggs, dried eggs, frozen eggs, scrambled egg mix, dessert powder, mayonnaise, margarine, ground beef and fish.

Tests that are made on these products include: total solids, moisture, fat, flavor, color, acidity, salt, total ash, alkalinity of ash, protein, sugar, bacterial plate count, direct microscopic clump count, yeast and mold count, E. coli count, proteolytic count, lipolytic count, sediment, pH, scorched particles, extraneous matter, solubility, density, viscosity, phosphatase, Starch, dispersibility, whey protein nitrogen, oxygen, and carbon dioxide.

Starting in the mid-1960's, nonfat dry milk fortified with Vitamin A had been tested for Vitamin A potency; starting in 1966, dry milks have been tested for possible *Salmonella* contamination; and since spring 1975, dry milks have been tested for possible penicillin contamination.

In addition to testing products in connection with dairy grading programs, the laboratory tests both dairy and non-dairy products for industry and other Federal agencies on a fee-for-service basis.

The testing of non-dairy products, other than egg products, began in the mid-1960's. One example is a blended food product, a mixture of nonfat dry milk, corn meal, soyflour, and vitamins and minerals (CSM), which has been distributed overseas to help combat malnutrition. To perform tests on CSM for export, additional Kjeldahl distillation equipment for protein test was installed, and a new consistometer to test viscosity of the product.

The Chicago laboratory since the mid-1960's also has been testing products for other divisions within the Agricultural Marketing Service and for other Government agencies. The products tested range from dried and frozen eggs for the Poultry Division, AMS to dry cream substitute for the U.S. Veterans Administration.

Although most of the work is done for Government agencies, the laboratory on request helps any plant, industry or private organization analyze its products. Often those official tests are used by plant managers as checks on the accuracy of their own plant's tests. The laboratory is also used by organizations such as hotels and restaurants wishing to check the quality of the products they buy.

Until the mid-1960's inspectors assigned to plants using the resident grading and quality control service (inaugurated in 1948) were given specialized training at the Dairy Division's laboratory in Chicago; and through 1969 the Chicago laboratory spotchecked their work at the plant. In addition, through 1969, each month identical product samples (coded) were sent to all the resident graders for analysis; the test results from each grader were compared to the Chicago laboratory findings and when significant testing variations arose, follow-up action was taken by supervisory personnel. Since 1969, the technicians selected for the resident program have received on-the-spot training at a resident plant before assignment. Also, since 1969, the performance of all laboratories (25), including the Chicago laboratory is measured statistically. Since 1970 each grader has been able to see his test results compared statistically not only with the Chicago laboratory but with his fellow graders as well. The summary of test results highlights testing variations by the graders and need for follow-up action by supervisory personnel from the regional and/or the Washington office.

SOME SELECTED PROJECTS AND EVENTS FROM THE MID-SIXTIES¹¹

The Chicago laboratory issued a report in April 1966, covering a 9-month study on vitamin fortified nonfat dry milk. The flavor of the fortified milk was comparable to the unfortified samples which were stored under identical conditions. There was a small decrease in vitamin A potency during the testing period, but this was not considered significant.

The results of this study correlated quite well with another stability study set up by the Inspection and Grading Branch, Dairy Division, C&MS, in cooperation with the Agricultural Stabilization and Conservation Service (ASCS) in Jan. 1966.

Nonfat dry milk packed in 100-pound, 50-pound and 4 1/2-pound containers, fortified by the various processing methods used by plants throughout the country, was placed in storage for 6 months at approximately 90°F. and 90 percent relative humidity. These conditions, set up in the Agricultural Research Service facilities at Beltsville, simulated conditions in overseas distribution channels. Laboratory tests in June revealed good flavor and vitamin stability. At 6 months there was a small decrease in vitamin A potency, but it was not considered significant.

The Dairy Division laboratory, in 1968, participated in a collaborative study on vitamin analyses of dry milk with the Vitamin Analysis Committee of the American Association of Cereal Chemists. The laboratory found that a modified method of vitamin analysis which they developed was considerably faster and reliable.

In Jan. 1965, George Sherman, microbiologist, Chicago laboratory had attended a school for testing foods for salmonella, at the U.S. Public Health Service Communicable Disease Center, Atlanta. At that time, the egg products industry was experiencing a salmonella problem, and since the Chicago laboratory was testing egg products for the Poultry Division, C&MS, it was essential for Sherman to be qualified for official salmonella testing work. When the incidence of salmonella contamination in nonfat dry milk was first reported in early 1966, the Chicago laboratory was ready to handle the necessary testing.

The Chicago laboratory tested 4,500 samples of nonfat dry milk and found 46 or about 1 percent to be salmonella positive during the 10-month study period, Mar. 1966 to Jan. 1967. Tests also were made on about 1,500 samples of environmental material. The laboratory reported 68 samples positive or about 4.5 percent.

The examination of CSM and dry cream substitute for salmonella contamination was also introduced in 1967.

Salmonella testing of dry milks was extended to the Dairy Division laboratory in Syracuse and the USDA licensed commercial laboratory in San Francisco, starting in Jan. 1967.

George W. Fry, staff member of the Washington office of the Inspection and Grading Branch, presently coordinates the salmonella findings and reports the confirmed positive test results to the Food and Drug Administration.

This coordinating and reporting responsibility was originally handled by Joseph Rubis (1967-1971), followed by Lynn G. Boerger (1971-1974).

Dizikes attended a meeting in June 1968 of the Food Protection Subcommittee of Food Microbiology, National Academy of Science. This group worked on a reference method for the detection of salmonella in foods which was based on the procedures used by the Dairy Division, C&MS, and the Food and Drug Administration.

The American Public Health Association in June 1969 invited Dizikes to join the Association's Intersociety Council. The Council was organized to develop, evaluate and publish the thirteenth edition of the Standard Methods for the Examination of Dairy Products. Dizikes was a member of the committee that prepared Chapter 10, "Microbiological Methods for Concentrated Milk and Dry Milk." The thirteenth edition of "Standard Methods" was published in 1972.

Dizikes met with technical representatives from both industry and the American Public Health Association in St. Petersburg, Fla., Dec. 27, 1972. This first meeting, to consider the fourteenth edition of Standard Methods for the Examination of Dairy Products, reviewed funding, research projects, staffing for chapter revisions, and collaborative analytical work. Dizikes was given the responsibility to work on Chapter 14, "Direct Microscopic Method," and Chapter 15, "Reduction Methods." The fourteenth edition of Standard Methods for the Examination of Dairy Products has been scheduled for publication in the fall of 1978.

The Chicago laboratory, in 1969, collaborated with the Agricultural Research Service on special studies for testing corn-soya-milk, use of cottonseed and soy oil as a replacement for corn oil.

In 1969, representatives from the Agricultural Research Service laboratory at Peoria, Ill., worked with the Chicago laboratory personnel on tests for cereal products. The Poultry Division, C&MS, detailed one of its employees to the Dairy Division laboratory for training. Industry representatives from Carnation Company, Waverly, Ia.; Roberts Dairy Company, Omaha, Neb.; Associated Milk Producers, Inc., New Ulm, Minn.; and Krause and Lauhauf Milling Companies at Milwaukee, Wis., and Danville, Ill., trained at the laboratory on testing methods for dairy and other food products.

The Chicago laboratory, in 1970, started testing for aflatoxins, CCC-owned nonfat dry milk which was found moldy upon cycle or reinspections as part of the monitoring program for storage stocks. Since Feb. 1975, testing for aflatoxins has been done by the Grain Division, AMS.

In late Jan. and early Feb. 1975, the Dairy Division announced to the dry milk, dry whey, and evaporated milk segments of the dairy industry that, effective Mar. 3, 1975, it was instituting a spotcheck penicillin testing program. Representative samples of products from such manufacturing plants have been tested for possible penicillin contamination using the FDA approved Sarcina lutea Cylinder Plate Method. The penicillin testing has been performed by the Chicago laboratory, the San Francisco laboratory, and the resident laboratories where the USDA grading and quality control service has been utilized. George Sherman, microbiologist in the Chicago laboratory, conducted two regional training schools in early 1975 for the benefit of the resident graders.

USDA OPENS SYRACUSE LABORATORY

In the early 1960's about 15 percent of the dairy products graded at the Dairy Division laboratory, Chicago, came from plants located in Eastern States, mainly Vermont, Massachusetts, New York, Pennsylvania, Maryland, and Virginia. Due to the distance to the Chicago laboratory, there were unavoidable delays in furnishing grading certificates to Eastern applicants, causing extra expense and hardship since applicants were required to wait for certificates before shipping the product. In order to provide this segment of the industry with more efficient and economical grading service, a Dairy Division laboratory was established at Syracuse, N.Y., in Sept. 1963.¹² Syracuse was centrally located to the approximately 40 plants in the Eastern States which were using the laboratory services.

George W. Fry, a supervisory chemist of the Chicago laboratory was placed in charge of the Syracuse laboratory, under the general direction of Dizikes. Fry remained in that capacity until Sept. 1969, when he transferred to the Washington office of the Inspection and Grading Branch, Dairy Division. LeRoy C. Iverson, technologist of the Syracuse laboratory succeeded Fry, and was in charge of the laboratory until it was closed in 1974.

The Syracuse laboratory operation saved considerable time for the dairy manufacturing plants, industrial and commercial users, and exporters in the Eastern States. In some cases, plants in that area received analytical results as much as 3 days earlier than when samples were tested at the Chicago laboratory. This permitted quicker movement of products to users, and released much needed warehouse space at plants. With a decreasing volume of Grade A milk being used for the manufacturing of dairy products in the early 1970's, the need for laboratory services at Syracuse diminished considerably. The laboratory was closed in Jan. 1974 and the analytical work was returned to Chicago.¹³

CROSS-UTILIZATION OF LABORATORY

In 1966, a study group was given the responsibility to:

*...study means for insuring that Consumer and Marketing Service laboratory facilities were shared or cross-utilized to the maximum extent possible.*¹⁴

It consisted of the following members: David A. Patton, Fruit and Vegetable Division; Jesse L. Helton, Grain Division; R.H. Philbeck, Technical Services Division; and Harold E. Meister, Dairy Division, Chairman.

The study group received information from all Divisions within C&MS as to the location of their laboratories, size, capabilities and extent of cross-utilization. It was found that considerable cross-utilization was being practiced; however, some Division laboratories were so specialized with tests peculiar to their particular commodities that cross-utilization would yield no advantage.

The various industries looked to the commodity divisions to develop and standardize test methods for determining compliance with product specifications or grades, or to use in quality improvement of the products of that industry. Members of the industry were frequently in touch with commodity specialists on revision of methods, improvement of techniques, and commodity-related problems with respect to analyses and quality control.

It is noteworthy that the Dairy Division rated high with respect to extensive capability for microbiological tests. This capability has been necessary because of the requirements for such tests to determine compliance with U.S. grades and federal or contract specifications for milk and milk products.

Ever since the dairy and poultry grading services were separated July 1, 1951, the laboratory facilities in Chicago have been administered technically and financially by the Dairy Division.¹⁵ However, the Chicago laboratory has continued testing services on egg products for the Poultry Division. In 1968, the laboratory began analyzing a scrambled egg mix (dehydrated) for the Poultry Division. When the program was first started, "high-heat" milk solids were added in the form of condensed skim milk. Based on recommendations by the laboratory, batches of product were also made with "high-heat" nonfat dry milk and both products tasted for palatability. The laboratory found "high-heat" condensed or nonfat dry milk equally satisfactory. The use of nonfat dry milk benefits the manufacturer since it does not require refrigeration, and is more convenient to handle and to use.

The Chicago laboratory in 1968 performed bacteriological testing on mayonnaise and dessert powder for the Fruit and Vegetable Division, C&MS.

In accordance with an agreement between the Dairy Division and the Livestock Division, the Chicago laboratory began testing meat samples (ground beef) in Aug. 1974. The program is still operative.

In addition to cross-utilization of laboratory services within USDA, there has been similar interagency activity. In fall 1965, the Chicago laboratory analyzed dried whole eggs for military purchase. Then, in Sept. 1966, the Dairy Division was assigned responsibility for the testing of dry cream substitute (coffee whitener) purchased by the U.S. Veterans Administration. The product is tested for moisture content, fat content, coliform, standard plate count, rate of wetting and salmonella (the latter test being added in 1967).

In fall of 1973, the Chicago laboratory performed microbiological testing on some fish samples for the National Marine Fisheries Service, Department of Commerce.

In accordance with an FDA/AMS agreement signed in July 1974, the Chicago laboratory has been testing samples of imported dry milks. The products include casein and sodium caseinate and nonfat dry milk. In addition to testing for penicillin, phosphatase and salmonella, the FDA has also requested that the samples be tested for standard plate count, protein, moisture, fat, titratable acidity, and extraneous matter.

CONTRACT LABORATORIES¹⁶

The American Dry Milk Institute laboratory facilities and personnel were utilized to officially grade nonfat dry milk under a contract of agreement from 1935 through 1943.

Arrangements were made with Golden State Company, Ltd., San Francisco, to utilize its facilities for a short period in fall 1934 for testing evaporated milk. A contract of agreement was entered into with the same company for the testing of various dairy and poultry products from 1941 to 1945.

The Dairy Products Laboratory, San Francisco, and the USDA entered into a contract of agreement, Jan. 1, 1946, for the former to provide the necessary facilities for the testing of various dairy products; the contract is still operative.

Also during World War II a contract of agreement was entered into with the University of Washington, Seattle, for the conduct of analytical work on dairy products. The need for the service continued after World War II, on a limited basis, until the Agreement was terminated as of June 30, 1975.

During 1950-1956, USDA purchased fairly large quantities of Cheddar cheese in Tennessee under the price support program. As usual, the Cheddar cheese had to be officially graded and tested for moisture and fat content before being offered for sale to the Government. To furnish more timely service to the sellers, arrangements were made with the Tennessee State Department of Agriculture to utilize its laboratory facilities at Nashville.

METHODS OF LABORATORY ANALYSIS

The Chicago laboratory in 1943 began publishing test methods they employed in the official analysis of dairy and other food products. The number of test methods has steadily increased over the years, and now totals 18, in keeping with modern laboratory procedures and the needs of industry and users of the products. Various test methods have been updated from time to time.

Each of the Chemists-In-Charge, over the years, contributed to the development of the various test methods. Since 1970 this material has been coordinated by George Fry of the Washington office.

CHEMIST-IN-CHARGE

The Chemist-In-Charge, in addition to his duties as head of the USDA, Dairy Division laboratory in Chicago, for many years, until 1970, was responsible for supervising all laboratory technicians licensed by the Inspection and Grading Branch. Since 1970 the performance of all laboratories has been evaluated statistically.

The laboratory supervisory staff is available to industry for consultation on technical problems and to perform special laboratory tests as may be requested.

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- 1 Interview with Byron H. Webb, Oct. 16, 1973.
- 2 Office records. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 3 Interview with Byron H. Webb, Oct. 16, 1973.
- 4 Contract file in the Administrative Services Division, FSQS, USDA.
- 5 Office records. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 6 Ibid.
- 7 Letter from Theodore I. Hedrick to the author, Jan. 2, 1975. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 8 Summary of Project Results, Packaging of Dried Skim Milk in Consumer-Size Packages, 12 pages, Oct. 1954. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 9 Office records. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 10 This section is based on records available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 11 This section is based on records available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 12 Office records. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 13 Ibid.
- 14 Report of Study Group on Cross-Utilization of Consumer and Marketing Service Laboratories, July 1, 1966. Available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 15 This section is based on records available in the Poultry and Dairy Quality Division, FSQS, USDA.
- 16 Ibid.

VOLUME OF PRODUCTS INSPECTED OR GRADED
AND INSPECTION AND GRADING BRANCH LAUDED

The first records of dairy products officially graded began with 1930 and covered butter and cheese for a 12-year period ending with 1942.¹

During the period 1935-1940, 142 million pounds of evaporated milk were inspected and 83 million pounds of nonfat dry milk were graded.

During the period 1942-1956 complete records were available covering the grading of butter, cheese, and dry milks and the inspection of evaporated milk, butteroil, Carter's Spread, and miscellaneous dairy products.

Cycle or regradings of butter and cheese were made during World War II and the postwar period, but the records did not separate these from the original gradings.

During the period 1957-1976, separate records were maintained reflecting the original grading and regrading poundage of butter, cheese, and dry milk and the quantity of these products involved in packaging and processing operations (in-process inspections).

During the period 1957-1976, excepting 1963, over a billion pounds of evaporated milk were inspected.

During fiscal years 1964-1969 over 1.3 billion pounds of butter, anhydrous milkfat, ghee, butteroil, cheese, dry milk, evaporated milk, and sweetened condensed milk were inspected at dockside, at many points.

During fiscal years 1966-1973, large quantities of vitaminized regular nonfat dry milk were graded each year; during fiscal years 1971-1974 significant quantities of vitaminized instant nonfat dry milk were graded; and during fiscal years 1970, 1975, and 1976 the volume graded was much less.

During fiscal years 1967-1976 large quantities of corn-soya-milk were inspected, including instant corn-soya-milk from 1971-1976, and sweetened instant corn-soya-milk from 1972-1976.

VOLUME OF PRODUCTS INSPECTED OR GRADED

Volume of Butter and Cheese Graded,
Calendar Years 1930-1941

	<u>Butter (1000 pounds)</u>	<u>Cheese (1000 pounds)</u>
1930	163,350	396
1931	188,546	536

Volume of Butter and Cheese Graded,
Calendar Years 1930-1941

	<u>Butter</u> <u>(1000 pounds)</u>	<u>Cheese</u> <u>(1000 pounds)</u>
1932	187,680	1,524
1933	269,311	1,568
1934	280,806	3,523
1935	214,568	2,293
1936	250,270	3,920
1937	272,931	3,325
1938	320,457	8,177
1939	271,339	5,515
1940	253,857	10,916
1941	298,133	167,437
Total	2,971,248	209,130

Volume of Evaporated Milk Inspected and
Nonfat Dry Milk Graded, FY 1935-1940

	<u>Evaporated Milk</u>	<u>Nonfat Dry Milk</u>
---million pounds---		
1935	38	13
1936	16	4
1937	19	25
1938	--	21
1939	3	14
1940	66	5
Total	142	82

Volume of Dairy Products Inspected or Graded,
Fiscal Years 1942-1949

	<u>Butter</u>	<u>Cheese</u>	<u>Dry Milk</u>	<u>Evaporated Milk</u>	<u>Butteroil</u>	<u>Carter's Spread</u>
---million pounds---						
1942	334	350	185	1,649	--	--
1943	443	216	290	352	--	--
1944	358	294	360	626	14	45
1945	218	188	400	622	8	2
1946	183	201	250	506	--	--
1947	167	160	354	355	--	--
1948	244	103	211	218	--	--
1949	326	200	517	160	--	--
Total	2,273	1,712	2,567	4,488	22	47

Volume of Dairy Products Inspected or Graded,
Fiscal Years 1950-1956

	<u>Butter</u>	<u>Cheese</u>	<u>Dry Milk</u>	<u>Evaporated Milk</u>	<u>Butteroil</u>	<u>Dry Whey</u>	<u>Mis. Product</u>
---million pounds---							
1950	601	207	842	61	--	--	--
1951	572	273	667	45	--	--	--
1952	365	91	240	59	--	--	10 <u>1</u> /
1953	733	257	569	9	--	--	28 <u>1</u> /
1954	1,336	1,011	1,233	5	--	--	21 <u>2</u> /
1955	1,431	1,143	997	30	59	248	14 <u>3</u> /
1956	1,160	1,319	1,049	25	80	2	12 <u>3</u> /
Total	<u>6,198</u>	<u>4,301</u>	<u>5,597</u>	<u>234</u>	<u>139</u>	<u>250</u>	<u>85</u>

- 1/ Canned fluid whole milk, canned sweet cream and ice cream mix.
 2/ Canned fluid whole milk, butteroil and whey (condensed and dry).
 3/ Canned fluid whole milk, malted milk, frozen milk, whipping cream and sour cream.

Volume of Butter Graded or Inspected,
Fiscal Years 1957-1976

	<u>Original Gradings</u>	<u>Regradings</u>	<u>In-Process Inspections</u>
-- million pounds---			
1957	644	9	87
1958	722	151	102
1959	587	221	140
1960	588	166	103
1961	689	260	139
1962	908	556	164
1963	824	915	281
1964	876	746	229
1965	880	305	140
1966	611	195	119
1967	761	72	96
1968	802	395	179
1969	785	300	147
1970	770	216	168
1971	823	267	145
1972	811	155	115
1973	776	256	153
1974	665	59	150
1975	684	20	73
1976	<u>537</u>	<u>23</u>	<u>17</u>
Total	<u>14,743</u>	<u>5,287</u>	<u>2,747</u>

Volume of Cheese Graded or Inspected,
Fiscal Years 1957-1976

<u>Original Gradings</u>	<u>Regradings</u>	<u>In-Process Inspections</u>
---million pounds---		
1957 225	570	264
1958 228	407	278
1959 47	67	116
1960 34	59	33
1961 32	3	8
1962 224	79	102
1963 127	193	187
1964 174	64	125
1965 113	29	115
1966 24	1	5
1967 76	--	76
1968 144	130	110
1969 102	107	89
1970 48	8	43
1971 103	--	58
1972 149	6	73
1973 79	3	16
1974 74	--	4
1975 179	--	95
1976 61	7	8
Total 2,273	1,733	1,805

Volume of Dry Milk Graded or Inspected,
Fiscal Years 1957-1976

<u>Original Gradings</u>	<u>Regradings</u>	<u>In-Process Inspections</u>
---million pounds---		
1957 843	53	399
1958 990	41	443
1959 921	91	498
1960 918	26	268
1961 1,000	389	431
1962 1,426	441	593
1963 1,411	1,009	606
1964 1,301	1,060	570
1965 1,258	187	279
1966 679	289	285
1967 689	5	253
1968 818	227	186
1969 706	647	199
1970 677	441	178
1971 702	53	228
1972 740	30	74
1973 498	31	32
1974 491	--	4
1975 719	107	9
1976 429	956	1
Total 17,216	6,083	5,536

Volume of Evaporated Milk Inspected,
Fiscal Years 1957-1976

---million pounds---

1957	30	1967	69
1958	15	1968	25
1959	14	1969	127
1960	12	1970	157
1961	19	1971	146
1962	33	1972	95
1963	--	1973	83
1964	83	1974	38
1965	68	1975	26
1966	84	1976	24
Total	<u>358</u>		<u>790</u>

Grand Total -- 1,148 million pounds

Volume of Dockside Inspections,
Fiscal Years 1964-1969

	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>
(million pounds)						
Butter	20	92	--	--	--	--
Anhydrous milkfat,						
Ghee and Butteroil	4	12	3	--	--	--
Cheese	--	2	--	--	--	--
Dry Milk	199	431	141	4	--	15
Evaporated Milk	22	4	2	1	--	--
Sweetened Condensed Milk	<u>56</u>	<u>61</u>	<u>84</u>	<u>71</u>	<u>23</u>	<u>58</u>
Total	<u>301</u>	<u>601</u>	<u>230</u>	<u>76</u>	<u>23</u>	<u>73</u>

Volume of Vitamized Nonfat Dry Milk Graded,
Regular and Instant, FY 1966-1976

	<u>Regular</u>	<u>Instant</u>
---million pounds---		
1966	279	--
1967	226	--
1968	294	--
1969	329	--
1970	251	9
1971	349	58
1972	289	87
1973	165	57
1974	--	42
1975	--	19
1976	--	4
Total	<u>2,182</u>	<u>276</u>

Volume of Blended Food Product
Inspected, FY 1967-1976

	<u>Corn-Soya Milk</u>	<u>Instant Corn-Soya-Milk</u>	<u>Sweetened Instant Corn-Soya-Milk</u>
---million pounds---			
1967	80	--	--
1968	290	--	--
1969	412	--	--
1970	315	--	--
1971	357	23	--
1972	410	15	66
1973	434	57	109
1974	--	53	29
1975	--	40	13
1976	<u>138</u>	<u>24</u>	<u>10</u>
Total	<u>2,436</u>	<u>212</u>	<u>227</u>

Inspection and Grading Branch Lauded

The work of the Inspection and Grading Branch has been and is carried out in an atmosphere of cooperation with industry on a pragmatic basis. This means assisting industry in quality and related problems, but always with firmness, impartiality, and integrity. A chummy relationship has never existed between industry and the Inspection and Grading Branch. To conduct the inspection and grading activities in disharmony with industry would be counterproductive.

Integrity is the hallmark of the Inspection and Grading Branch. That status is achieved only by consistent performance of total honesty.

There has never been a scandal involving dairy products inspection and grading personnel. That not only speaks well for the management and operating personnel of the Inspection and Grading Branch, but also for the various segments of the dairy industry. The respect for the competency and integrity of the inspection and grading service is well reflected in a few examples of laudatory comments.

Lawrence I. Graham, trade counselor, former manager of the commissary and buyer for Childs Company, New York City, in an article captioned "Buying for New York Restaurants, Hotels and Steamships," in 1931, advocated the purchase of perishables on Government grades and criticized the prevailing methods of purchase. L.I. Graham said in part:

...And then there's the Government Inspection Service. Without doubt that is the best guarantee and the most economical means that a buyer can utilize to assure himself that he is securing merchandise that meets his specifications. He can have his merchandise inspected in the country, or at point of arrival, or at the vendor's place of business, or at his own receiving station. He can use this service when he wants it and as long as he wants it, at ridiculously low rates. And for it he has at his command experienced men, specialists in their particular commodity line, who give an absolutely impartial decision (48).

The Inspection and Grading Branch for many years (1920's into the 1960's) graded butter and cheese intended for delivery to the Childs restaurants in New York City.

Robert W. Leffler, President, Wisconsin Cheese Exchange, Plymouth, Wis., addressed a complimentary letter on Sept. 13, 1943, to Thomas G. Stitts, Chief, Dairy and Poultry Branch, Food Distribution Administration, Washington, D.C., which read in part:

...It has been my intention to write you for some months about the fine work your representatives have been doing in the handling of cheese purchases from our members. You and Ommodt can be proud of the accomplishments of Harold Meister and Harry Sartorius. The grading of cheese in Wisconsin has gone along very smoothly all year. The increased volume during the flush was handled without a moment's delay.²

The National Milk Producers Federation at their 47th Annual Meeting in the fall of 1963, passed a resolution which read in part:

...We commend the USDA for the development and administration of its inspection and grading programs, particularly the dairy plant survey and the resident grading and quality control programs. We urge the USDA to make these services available on a broader basis.³

Edward Thom, Editor, Manufactured Milk Products Journal, made the following comment in 1965:

...Half of all the butter, cheese and nonfat dry milk produced in the United States--5.7 billion pounds--reports the Agricultural Marketing Service of USDA, were either graded by AMS or the grading was supervised by that branch of our government. Considering the amount of money hinging upon the decisions of those graders, it's not only commendable, but downright remarkable how relatively untouched by the taint of scandal this division of our government has remained through the years. Bouquets are in order (78, p. 31).

In the 58 years of official inspection and grading activities on dairy products, only five individuals were involved in impermissible conduct. In no instance was a bribe involved.

On May 10, 1971, Ervin R. Bartle, area supervisor, headquartered at Minneapolis, addressed 120 dairymen at the Dakota Dairy Tech meeting in Brookings, S.D., and reviewed the inspection and grading programs. While at the meeting he received a certificate from the T.M. Olson Dairy Club for "Outstanding Service to the Dairy Industry." He also was presented a plaque from the Dakota Dairy Technology Society which expressed their appreciation for his outstanding contributions to the dairy industry of that area.⁴

Learning of Arthur Kuecker's (assistant area supervisor headquartered at New York City) retirement in Jan. 1972, a plant manager addressed a letter to Art expressing the belief that as a USDA inspector he blended a combination of thoroughness and expectation for high standards, along with a desire to help plants upgrade their facilities.

This philosophy of striking the proper balance in requiring high standards of industry performance with a helping attitude, is what has made a service oriented organization like the Inspection and Grading Branch, Dairy Division really effective.

The plant manager of L.D. Schreiber Cheese Company, Inc., Carthage, Mo., on Sept. 22, 1976, addressed a letter to the Inspection and Grading Branch, Minneapolis, to the effect that Miles W. Rawhouser's survey of their cheese processing operations was very thorough and beneficial in helping them to maintain "approved plant" status.

The Chicago laboratory, from the time it was established in 1941, has assisted industry in their testing procedures and manufacturing problems; and likewise have given assistance to users of dairy products, particularly with reference to test procedures and quality control problems.

Dizikes and his laboratory staff, in Aug. 1966, received two complimentary letters. One was from the quality control manager of the "Kitchens of Sara Lee," Chicago, users of fancy butter in their frozen baked goods. He thanked Dizikes for an interesting tour of the Chicago laboratory and for assistance to "Sara Lee" technicians on some of their laboratory work. The other was from William Graddy, Nebraska Food Packaging Company, Britt, Ia., thanking laboratory personnel for the courtesies in replying to inquiries on technical questions covering vitaminizing of nonfat dry milk and for efficient service on testing samples for vitamin content. He also stated that this was one of the finest jobs of cooperation between industry and government that he had ever experienced.

George W. Fry and the Syracuse laboratory also received a complimentary letter in Sept. 1966, from the Clearfield Cheese Company, Curwensville, Pa., for helping them standardize their composition testing procedures.

The Inspection and Grading Branch, including the laboratory operation, has received many oral compliments over the years from industry and others on their professional competence and assistance.

¹ This section is based on records available in the Poultry and Dairy Quality Division, FSQS, USDA.

² Letter from R.W. Leffler to T.G. Stitts, Sept. 13, 1943. Available in the Poultry and Dairy Quality Division, FSQS, USDA.

³ Resolution commending the Inspection and Grading Branch, Dairy Division, AMS. National Milk Producers Federation, Forty-Seventh Annual Meeting, 1963.

⁴ The balance of this section is based on records available in the Poultry and Dairy Quality Division, FSQS, USDA.

AMS PROCEDURES AND STANDARDS APPLICABLE TO
ALL INSPECTION AND GRADING ACTIVITIES

UNITED STATES STANDARDS FOR CONDITION OF FOOD CONTAINERS

The condition of containers for food products may greatly affect marketability and consumer acceptance. Types of containers used to hold food include all immediate or primary boxes, and shipping containers such as fiberboard, wooden boxes, and crates.

A special working group was organized in early 1963 to determine if a uniform standard for examining containers by all AMS inspectors was practical and workable.

Appropriate standards were developed, designed to give a statistically sound basis for evaluating exterior condition of filled food containers. The proposed standards were published in the Federal Register, March 2, 1963.¹ They were structured to provide: (1) uniform acceptance and rejection criteria for containers; (2) known sampling risks to the vendor or buyer; (3) uniform inspection and acceptance procedures within the Agricultural Marketing Service; (4) uniform guidelines to interested parties; and (5) various levels of acceptance that may be adopted by Government procurement agencies and other interested persons.

Tentative U.S. Standards for Condition of Food Containers were published in the Federal Register, July 9, effective Aug. 8, 1963.²

These tentative standards satisfied a need for a yardstick to measure the acceptability of a lot whenever the conditions of the exterior of filled food containers were requested as a part of a sales transaction. The standards were issued in tentative form to afford interested parties ample time to utilize and study them, and to offer further comments.

After two years of practical application of the tentative standards in the field, of an extensive study of the various provisions, and of a review of suggestions from interested parties, the standards were amended and published in the Federal Register, Dec. 15, 1965.³ The changes and additions were:

1. Provision was made for normal, tightened, and reduced inspection. This allows latitude in sample size.

2. Sampling plans for condition of containers were realigned and the number of plans was reduced to provide for simplified procedures of sampling, compatible with the usual size of lots to be examined.

3. The maximum number of primary containers to be drawn from various size cases was changed in order to reduce the amount of destructive sampling of shipping cases.

4. Changes were made in the AQL's (Acceptance Quality Levels) for the respective class of defects.

5. A separate table of defects for labeling and marking was established.

6. New tables of defects were made for the various types of containers. In each table a section was included to cover the general defects.

7. Certain definitions were amended or added for the sake of clarity.

Except for minor grammatical and editorial changes or corrections the standards were promulgated and published in the Federal Register, Mar. 19, effective Apr. 18, 1966.⁴

The standards help a USDA grader determine if a shipment of food packed in cans meets an acceptable quality level, by giving him a means of determining the extent of defects such as dents, breaks, and other damage to the cans. The standards also provide a means of expressing, in mathematical terms, a desired quality level and a means of determining the size of sample needed for inspection to assure that a lot meets that quality level.

The standards are used primarily by USDA in its purchase of foods for the school lunch program and for distribution to the needy. Commercial users of USDA grading and acceptance services may request the "condition of containers" service as an additional factor in quality determination. The U.S. Department of Defense uses in its food purchase program some of the factors set forth in the standards.

A buyer does not want containers with defects, but he recognizes that some defects will occur in the processing and handling operations. Therefore he is willing to accept the merchandise with a certain percentage of defects. This percentage is expressed as the "acceptable quality level."

A sampling plan enables the inspector to determine how many samples should be drawn from a particular lot to permit an evaluation of container condition. It also describes the number of defects permitted for each sample under each AQL for acceptance. In other words, a sampling plan is a guide--based on the laws of probability--which furnishes a scientifically reliable prediction of the quality of a total lot based on a small sample.

A defect is any condition of a container that might lower its value on the market place. The standards classify defects in three categories: critical, major, and minor. By identifying defects in terms of their importance or seriousness, the inspector can examine a sample more scientifically and objectively.

The standards were under continuous review, and proposed amendments were published in the Federal Register, Mar. 27, 1971, designed to state more clearly the purpose and use of the standards and provide for their broader application.⁵

The amended standards were published in the Federal Register, Sept. 15, effective Nov. 1, 1971.⁶

On Nov. 12, 1975, the Department published in the Federal Register⁷ proposed amendments to provide procedures for skip-lot sampling and inspection. Skip-lot sampling and inspection are special procedures for inspecting stationary lots in which only one-half or one-fourth of the lots offered for inspection are formally inspected. Such procedures would apply only when approved by the Administrator, and when previous lots from the user of the procedures have been consistently acceptable. Skip-lot sampling and inspection rewards good processors by reducing both the inspection costs and any destructive sampling. It also requires less sampling and achieves essentially the same results as sampling and inspecting every lot.

It was intended that the use of the skip-lot sampling and inspection procedure would be optional. However, the Department encouraged the use of such procedure to determine their effectiveness pending formal adoption. A 6-month period was permitted for application of the procedures and for comment on them.

The promulgated standards were published in the Federal Register, Sept. 28, effective Nov. 1, 1976.⁸

UNITED STATES STANDARDS FOR SAMPLING PLANS FOR INSPECTION BY ATTRIBUTES

The Agricultural Marketing Service, over 20 years ago, began to incorporate statistical sampling techniques for attribute inspection in some of its inspection procedures. Further study was given to these techniques in the sixties, in the awareness that significant advances were taking place in sampling procedures, especially in the field of statistical sampling for attribute-inspection.

The working group or committee which developed the U.S. Standards for Condition of Food Containers in 1963 was charged with the responsibility of formulating U.S. Standards for Sampling Plans for Inspection by Attributes. The standards, which were published in the Federal Register, and effective May 5, 1964, provide attribute sampling plans for use by all of the commodity divisions in the Agricultural Marketing Service.⁹ Private industry may also select and use such sampling plans from these standards as may suit their inspection programs. The use of these standards is not mandatory; however, the Department recommends their use.

"Inspection by attributes" represents inspection whereby either the sample unit is classified as defective or non-defective with respect to a requirement or set of requirements (when on a "defective" basis); or inspection whereby the number of defects in each sample unit is counted with respect to a requirement or set of requirements (when on a "defect" basis).

The term "attributes" refers to the measurement of a given factor by noting and recording the presence or absence of some characteristic (attribute) in each of the units in the group under consideration.

PROCEDURES FOR DETERMINING NET WEIGHTS OF FOOD PRODUCTS

During the mid-sixties consideration was given to the development of standard procedures for determining the net weight of food products. A committee was appointed to study the matter in order to establish more uniform inspection and grading procedures throughout the Consumer and Marketing Service. Standard procedures were developed after consultation with representatives of the following: the Food and Drug Administration, the National Bureau of Standards of the Department of Commerce, the Agricultural Stabilization and Conservation Service, and the USDA Food and Nutrition Service. The standard procedures were published in the Federal Register, Dec. 18, 1971, under proposed rule making.¹⁰

Several reasons were advanced for the establishment of standard procedures for determining net weight of food products. The Department considered that the use of the same terms and procedures by the divisions of Consumer and Marketing Service should:

1. Eliminate some of the complications encountered by persons who deal with more than one division.
2. Enable users to understand and evaluate C&MS inspection and grading procedures more easily.
3. Insure that similar products inspected or graded by different divisions will be evaluated in a similar manner.
4. Provide better support for procurement dockage policies.
5. Make it easier for divisions to cross-utilize inspection and grading personnel.

The purpose of the proposed procedures was to provide statistical sampling plans for determining compliance of various products with average net weight requirements.

Although the standard procedures were proposed specifically for determining compliance with net weight requirements, the principles involved could also be used for determining compliance with other requirements which are amenable to objective determination, as for example, drained weight, fluid content, fill weight, percent solids, brix, viscosity, and consistency.

In developing the proposed standard procedures, it was evident that three basic plans would be useful. Therefore, the proposal included: A double-sampling plan for stationary lots (completed lots), a single-sampling plan for stationary lots, and on-line sampling plan for use during production.

All the proposed standard procedures were evaluated statistically through the study of Operating Characteristic (OC) curves, and through simulation of their performance under various conditions that might arise in actual application.

It was hoped that the proposed standard procedures would prove useful and acceptable to those outside C&MS who would do inspection, grading, or quality control work. In order to provide ample time for interested persons to study and apply the proposed standard procedures, a full year was allowed for comment. During that time, it was also planned to make trial use of the standard procedures in C&MS purchase programs.

During the period allowed for comment on the proposal, USDA worked with representatives of the National Bureau of Standards, the Food and Drug Administration, the Federal Trade Commission, the Office of Consumer Affairs, State Weights and Measures Officials, and representatives from various industries. This was an attempt to resolve differing opinions.

However, the Agricultural Marketing Service published a Notice in the Federal Register, Aug. 8, 1973, that the proposed Procedures for Determining Net Weights of Food Products, would not be promulgated as a final rulemaking pending resolution of the procedures with other affected government agencies.¹¹

It was concluded that the ideal solution would be for the National Bureau of Standards to revise its Handbook 67 (Checking Prepackaged Commodities; A Manual for Weights and Measures Officials) so that it could be adopted not only by State weights and measures authorities, but also by FDA and USDA. This continues to be the goal. In the interim, however, standard procedures have been developed primarily by the AMS committee and published as an AMS Handbook "Recommended Interim Procedures for Determining Net Weights of Food Products," dated Aug. 1976.

The actual net weight of a unit is defined as the unit's gross weight minus the unit's tare weight at the time of inspection.

The sampling procedures in the handbook are based upon two fundamental concepts:

1. The average net weight of all the units in the lot, called the lot average net weight, must equal or exceed the declared net weight for each unit in the lot.
2. No unreasonable shortages are permitted in individual units in the lot.

The lot is the basic entity to which the procedures stated in the handbook apply. A lot is defined as a "convenient and clearly identified collection of packaged food product units of the same size, type and style produced under conditions which are as uniform as possible and which are available for inspection at one place at one time."

The amount of inherent weight-variability in individual containers depends upon factors such as the nature of product, off size of containers, and the level of sophistication and quality control of the packaging process. There is no single procedure which would adequately account for all these factors in every conceivable inspection situation.

A certain amount of variability in weight among individual production units is inherent, and unavoidable, in any packaging process.

- 1 28 F.R. 2034.
- 2 28 F.R. 6939.
- 3 30 F.R. 15424.
- 4 31 F.R. 4687.
- 5 36 F.R. 5800.
- 6 36 F.R. 18455.
- 7 40 F.R. 52735.
- 8 41 F.R. 42639.
- 9 29 F.R. 5870.
- 10 36 F.R. 24069.
- 11 38 F.R. 21416.

RELATED ACTIVITIES

Personnel of the Standardization Branch and the Inspection and Grading Branch, Dairy Division, have for many years participated in dairy programs that are closely related to their work.

Four specific programs are: Food and Agriculture Committee of Government Experts on Milk and Milk Products; 3-A Sanitary Standards of Dairy Equipment and Practices; Collegiate Dairy Products Evaluation Contest; and the National Labeling Committee. A fifth closely related but general program, conducted on a continuing basis, is that of Federal-State Relations.

Members of the Standardization Branch participate on certain committees of the International Association of Milk and Food Sanitarians, Future Farmers of America, and National Conference on Interstate Milk Shipments. For many years the Chief of the Standardization Branch had been a member of the Board of Directors of the National Conference on Interstate Milk Shipments and for the past several years a Deputy Director of the Dairy Division has served on the Board of Directors of the National Mastitis Council.

This chapter will briefly review the five programs mentioned above.

FAO COMMITTEE OF GOVERNMENT EXPERTS ON MILK AND MILK PRODUCTS¹

In 1958, the Food and Agriculture Organization of the United Nations established the FAO Committee of "Government Experts on the Use of Designations, Definitions, and Standards for Milk and Milk Products." The aim was to bring about a worldwide movement in developing unified standards that would protect the interests of consumers and producers, promote fair trade practice, and facilitate international trade.

The International Dairy Federation in 1954 laid the groundwork for an international agreement on the terminology applicable to milk and milk products as a means of protecting both consumers and producers against misleading designations, especially in international trade. The Federation further considered it necessary to define standards of composition for such products, as well as methods for sampling and analysis.

The Ninth Session of the FAO Conference (1957) adopted a Resolution requesting the Director-General, in consultation with the International Dairy Federation and other interested international organizations, to invite all Governments to nominate experts to a Committee whose task would be to present proposals for internationally acceptable designations, definitions and standards for milk and milk products.

In the spring of 1958 the Director-General invited the United States Government to nominate experts to this continuing Committee, which was to hold yearly one-week work sessions at the FAO headquarters in Rome, Italy.

The U.S. State Department accepted the invitation and requested the establishment of an Interagency FAO Subcommittee on Milk and Milk Products. USDA was requested to provide the operating leadership of the Subcommittee. The Secretary of Agriculture, through the Agricultural Marketing Service, delegated that responsibility to the Dairy Division. Herbert L. Forest, Director of the Dairy Division, designated B.J. Ommundt, Chief of the Inspection and Grading Branch, as chairman of the Subcommittee. Other members of the 1958 Subcommittee were: Harlan J. Emery, Livestock and Dairy Division, Agricultural Stabilization and Conservation Service; Ralph E. Hodgson, Dairy Husbandry Research Branch, Agricultural Research Service; Edward Small (Secretary), Standardization and Program Development Branch, Dairy Division, Agricultural Marketing Service; D.R. Strobel, Dairy and Poultry Division, Foreign Agricultural Service; John D. Faulkner, Division of Sanitary Engineering Services, U.S. Public Health Service, Department of Health, Education and Welfare; William Horwitz, Dairy and Food Division, Food and Drug Administration, HEW; and Thomas C.M. Robinson, State Department.

Considerable work was involved in the development of material for the guidance of the U.S. delegation attending the First Session of the Committee, held in Rome, Sept. 8-13, 1958. The U.S. delegation comprised B.J. Ommundt, delegate; D.R. Strobel, alternate delegate; and William Horwitz, adviser.

The first task at the Sept. session was the formulation of a Code of Principles Concerning Milk and Milk Products. A preliminary text of a Code of Principles was based on a draft prepared by the International Dairy Federation. The first edition of the Code was finalized at the 1959 session and has been updated several times; the current or seventh edition was published in 1973.

The Code was not given the status of an international convention, such as the Stresa Convention on cheese, with its full diplomatic procedure, but it was established as recommended rules for voluntary adoption without recourse to Treaty procedure.

Governments are requested to inform the Director-General of the Food and Agriculture Organization or the Director-General of the World Health Organization whether they intend to apply the provisions of the Code of Principles.

The purpose of the Code is to protect the consumer of milk and milk products and to assist the dairy industry on both the national and international levels by ensuring the precise use of the term "milk" and the terms used for the different milk products. The Code contains six Articles dealing with: (1) Milk, (2) Milk Products, (3) Composite Products, (4) Other Products, (5) Labeling, Presentation and Publicity, and (6) Extent of Application. Unless otherwise stated, the provisions of the Code apply to all products whether imported, exported or produced and offered for sale upon the home market.

The Code and the individual standards established in association with it are not intended to affect the adoption and use of more rigorous requirements or standards under domestic legislation.

As of Mar. 1961, 37 FAO member countries had accepted the basic Code of Principles. For the United States, acceptance must come from the individual States. No State has rejected the Code.

The International Dairy Federation prepares the first draft standards of the proposed world standards. These draft standards are transmitted by the Director-General to various FAO member governments for their comments. The subcommittee then prepares a position paper, which, after approval by all agencies represented in the group, serves to guide the U.S. delegation in conducting negotiations at the Rome meetings. From its inception, the subcommittee has kept the U.S. dairy industry informed of its activities and has sought industry advice and assistance in formulating the U.S. position.

B.J. Ommundt retired in the summer of 1959, and Harold E. Meister was appointed as Chairman of the FAO-Interagency Subcommittee on Milk and Milk Products, the composition of which remained basically the same through 1962. Harold Meister was elected to serve as Chairman of the Fifth Session of the Committee of Government Experts, held in Apr. 1962.

Definitions and Standards

The first definitions and standards which the Committee developed in the early years related to: butter, butteroil (anhydrous), Cheddar cheese, evaporated milk and evaporated skim milk, sweetened condensed milk and skimmed sweetened condensed milk, whole milk powder, partly skimmed milk powder and skimmed milk powder, and a general standard for cheese.

The definition and standard formulated for butter by the Committee of Government Experts was unacceptable to the U.S. Government for the home market, because it is more restrictive than our own standard. The Mar. 4, 1923, legislative standard for butter required a minimum butterfat content of 80.0 percent, whereas the FAO/WHO standard, in addition, limits the moisture content to 16.0 percent.

A proposal for a composition standard applicable to all cheese varieties was discussed at the Fourth Session of the Committee held in Mar. 1961. This brought a protest from the U.S. delegation, since such a standard would not be compatible with U.S. standards for individual varieties. As a result, major cheese-producing countries were asked to provide the FAO Director-General with descriptions and composition standards for the types of cheese they produce. These then were considered by the Committee at the 1962 meeting. The U.S. delegation proposed the concept of setting up individual variety standards for cheese. No action was taken.

The FAO Director-General submitted to the 11th Session of the FAO Conference held in Rome in 1961, a proposal for a joint FAO/WHO program of food standards. This proposal was endorsed by the Conference. Henceforth the Committee represented the Food and Agriculture Organization and the World Health Organization.

A Joint FAO/WHO Conference on Food Standards was held in Geneva, Oct. 1-5, 1962. That Conference endorsed the establishment of the Codex Alimentarius Commission and developed guidelines for the work of the Commission. Subsequently, WHO approved the proposal for the establishment of the Codex Alimentarius Commission. Thus, with the earlier adoption of the resolution by the FAO Conference, the food standards program began as a joint undertaking of FAO/WHO in 1963.

The first session of the Codex Alimentarius Commission was held in Rome in 1963. When the Codex Commission was established, it was decided that the Joint FAO/WHO Committee of Government Experts on the Code of Principles Concerning Milk and Milk Products would serve as a subsidiary body of the Codex Commission with exclusive competence for all questions concerning milk and milk products. Therefore, decisions of the Committee would be decisions of the Commission in the specific field of milk and milk products. However, in certain cases the decisions made by the Committee could be reviewed by the Commission before acceptance.

Work was started on a general standard for process cheese at the Sixth Session, in June 1963. There were preliminary discussions on the Committee's role in establishing codes or practice covering hygiene of manufacture for milk plants and methods of milk inspection.

At the Seventh Session, held in May 1964, preliminary consideration was given to the development of minimum requirements for milk hygiene in developing countries. The Committee decided to consider food additives for dairy products in two categories: (a) those for which provision is made in the product standard, and (b) additives for which no provision is made.

At the Eighth Session, held in May 1965, imitation milk products were considered, along with standards for individual varieties of cheese, process cheese, cheese foods, and cheese spreads. Applications were received for standards on 72 varieties of cheese, half of which were ultimately covered by the general definition and standard for cheese. Definitions and standards have since been developed for 34 individual varieties of cheese.

J.B. Stine, Chairman, Research Committee, National Cheese Institute, has been a member of the U.S. delegation since 1965, as an advisor, and has contributed substantially to the formulation of many of these cheese standards, including process cheese products.

The U.S. Government has accepted, under criteria existing before the Codex Commission rules were established, the standards for the following cheese varieties: Cheddar, Edam, Gouda, Cheshire, Emmentaler, Gruyere, Limburger, Provolone, and Cottage Cheese.

The reports from France, Italy and Switzerland on the problem of "Appellation d' Origine" for certain cheeses as provided for under the Stresa Convention of 1951 were considered at the 12th Session, July 1969. The matter was not fully resolved, but the majority agreed that each application for a standard would have to be considered on its own merits and that those applications which had been delayed since 1966 were to be reviewed. The U.S. delegation agreed to accept the initiative in conferring with Italy and other interested countries on standards for Gorgonzola, Parmegano, and Romano varieties of cheese. As a result of an active exchange of views, a draft international standard for Extra Hard Grating Cheese was recommended in 1975, and was submitted to governments for comments.

Since 1963, the Committee adopted standards for other major milk products, namely: whey cheeses, process cheese, process cheese foods, process cheese spreads, and cream powder. In 1970, the standard for process cheese products were submitted to governments for acceptance. Stine, was chairman of the working group that developed the standards. It was a difficult standard to develop, because countries had such divergent ideas at the beginning as to what the various process cheese products should consist of.

Apart from standards for cheeses, other products for which standards are being elaborated are cream, yogurt, and edible casein and caseinates.

When cleared under Codex Commission rules, the standards are published and recommended for acceptance by FAO and WHO member and associate member countries. The Codex Commission determines when a standard is published as an international standard. In the United States, the recommended standards are considered, and acceptance accomplished under rules and regulations established for this purpose by the Food and Drug Administration, HEW.²

In July 1974, the Codex Commission revised the procedure for acceptance of international standards by countries. The revision provides for "Full Acceptance" and "Acceptance with Specified Deviations," the latter category replacing "Acceptance with Minor Deviations." This procedure supersedes the acceptance policy that had been established by the FAO Committee of Experts on the Code of Principles Concerning Milk and Milk Products and Associated Standards. This policy read as follows:

Acceptance of any of these standards is not intended to affect the adoption and use of more rigorous requirements under domestic legislation, as well as those concerning hygiene and grading, but any product conforming to the requirements of the standard shall be designated in accordance both with the standard and with domestic legislation.

Countries that accepted any of the standards under the Committee of Experts policy have undertaken action to accept the standards under the Codex Commission procedure. Hampering a rapid rate of acceptance under the new procedure is the fact that many of the standards are undergoing revision to bring them abreast of new developments in production and marketing and national legislation.

The Codex Alimentarius Commission at its Ninth Session, Nov. 6-17, 1972, decided to establish a worldwide Codex Committee on Edible Ices under the Chairmanship of the Government of Sweden. This decision was the final result of a number of years of discussion of standards for edible ices, both in the Commission itself and in the Coordinating Commission for Europe, where in 1965 the first proposal for a European Regional Standard for Edible Ices was drafted. Further, the Codex Committee of Government Experts on Milk and Milk Products worked on the preparation of draft standards for ice cream and milk ices for a number of years.

Methods of Sampling and Analysis

Simultaneously, with work on standards for milk and milk products, the Committee developed methods of sampling and analysis. William Horwitz, FDA, developed the procedures for presentation by the U.S. delegation. In 1962, Horwitz also represented the Association of Official Agricultural Chemists when AOAC was designated by FAO as a liaison organization to FAO for developing standard methods of analysis. In 1965, similar status was given to the International Dairy Federation and the International Standardization Organization. Robert W. Weik replaced Horwitz as a member of the U.S. delegation in 1967 and also as the AOAC representative.

In addition to the sampling methods for milk and milk products, fourteen different methods of analysis have been developed for milk and for the various milk products.

Working Procedures

The working procedures of the Joint FAO/WHO Committee of Government Experts on the Code of Principles Concerning Milk and Milk Products are addressed to three main categories: (1) Procedure for the Elaboration of Milk Product Standards; (2) Procedure for the Elaboration of International Individual Cheese Standards; and (3) Procedure for Elaboration and Publishing Methods of Sampling and Analysis.

The Procedure for the Elaboration of Milk Product Standards involves ten steps. The International Dairy Federation prepares a draft standard, taking into account any information supplied by member governments, or otherwise available. A report, accompanied by the draft standard, is sent to the Committee's Secretariat by IDF for distribution to member states of FAO and WHO as a working paper for the next session of the Committee. The recommended standard is published as a standard in the "Code of Principles Concerning Milk and Milk Products" when the Committee determines that it is appropriate in the light of the acceptances received. Similar action is taken by the Codex Alimentarius Commission.

The Procedure for the Elaboration of International Individual Cheese Standards also involves ten steps. Governments submit to the Secretariat their applications with complete supporting documentation. Upon receipt of

an application, the Secretariat informs all governments and sends to the IDF full documentation about the variety with an indication of priority to be assigned to the application. The Secretariat places before the Committee those applications upon which IDF has reported, together with the draft standards and the IDF report. The recommended standards are published in the same manner as described in the Procedure for the Elaboration of Milk Product Standards.

The Procedure for Elaboration and Publishing Methods of Sampling and Analysis involves eight steps. After the Committee states its requirements concerning sampling and analysis for the application of the Code and the standards of composition it has adopted or has under consideration, it invites the International Dairy Federation, the International Standardization Organization, and the Association of Official Agricultural Chemists to prepare a preliminary standard method. This preliminary standard method is then submitted by IDF to the Secretariat, who in turn submits the text to all FAO and WHO member governments for comments and discussion at the next session of the Committee. The Secretariat transmits the comments of the Committee of Experts to IDF, ISO, and AOAC. The latter three organizations prepare and publish the final version of the method and transmit a copy to the Secretariat. The Secretariat submits the final version of the method to the Committee for approval. The Secretariat then submits the final version to all FAO and WHO member governments for acceptance.

U.S. Committee on FAO/WHO Standards for Milk and Milk Products

Specialists in all phases of the dairy industry representing production, manufacturing, marketing, regulatory and public health have contributed to the activities of the U.S. Committee on FAO/WHO Standards for Milk and Milk Products. Most members of the U.S. Committee are and have been Government experts in their field, and a few are industry specialists. Subject matter for discussion at each session in Rome is reviewed and interpreted by the U.S. Committee. Background material is developed for use by the U.S. delegation: this includes suggestions and recommendations to be incorporated in the U.S. Position Paper. Generally two meetings are held prior to the participation of the U.S. delegation at the work sessions at Rome. Activities also entail considerable work between Rome sessions, carried on mainly by the Chairman.

The U.S. Committee has had only four chairman from 1958 to the present, namely: B.J. Ommodt, 1958; Harold E. Meister, 1959 to 1965 and 1973 to 1976; Floyd E. Fenton, 1966 to 1972; and Joseph A. Rubis, 1977 to present. The chairman serves as the U.S. delegate and head of the U.S. delegation.

U.S. Delegation

Each member of the U.S. delegation has to deal with varied and complex problems. These problems relate for the most part to the Code of Principles; elaboration of product standards, including a variety of international

individual cheese standards; methods of sampling and analysis; food additives and labeling. As part of the process of updating, all of these problems are continually reviewed, and amendments or revisions are required. The size of the U.S. delegation has varied over the years, ranging from three to seven.

The chairman of the U.S. delegation issues a report on the discussions, decisions and actions taken after each Rome session.

Acceptance of the Code of Principles and Associated Standards

Seventy-two governments have accepted the Code of Principles Concerning Milk and Milk Products. Original elaboration of individual standards has been accepted as follows: 45 governments for compositional standards for butterfat and evaporated milk; 46 governments for the compositional standards for butter and sweetened condensed milk; 64 governments for the compositional standard for milk powder; 35 governments for the general standard for cheese; and 18 governments, the standard for whey cheese.

The current positions on acceptance by governments of the revised compositional standards show the following breakdown: 11 governments for butter; 7 governments for butteroil; 10 governments for evaporated milk; 12 governments for sweetened condensed milk; 9 governments for milk powder; 10 governments for whey cheese; 9 governments for general standard for process cheese; 5 governments for general standard for process cheese preparation; 4 governments for cream powder; and 4 governments accepted the standard for yogurt.

Currently 34 international cheese standards have been elaborated and accepted by 3 to 19 countries.

Future Work

Harold E. Meister, Chairman of the U.S. Delegation to the Eighteenth Session of the Joint FAO/WHO Committee of Government Experts on the Code of Principles Concerning Milk and Milk Products, Rome, Italy, Sept. 1976, in his Report to the U.S. Delegation, summarized the future work as follows: Redraft of the General Standard for Cheese, Draft Standard for Extra Hard Grating Cheese, Redrafts of the General Standards for Processed Cheeses, and Revised Draft Code of Hygienic Practice for Dried Milk. Other items for inclusion in the agenda for the next session were definitions of pasteurization, UHT and sterilization processes; government comments on the meaning of specified deviation; and the question if the Committee should consider standards for imitation milk products.

Consideration had been given in the early 1970's to the hygienic requirements for milk and milk products with particular reference to the inclusion of microbiological and product specifications in codes and standards elaborated under the FAO/WHO Standards Program. The need for specifications of this kind had been stressed by a number of international bodies including the World Health Assembly, the Executive Board of WHO, and the UN Conference

on Human Environment. Attention of the Committee at the Seventeenth Session, held in Apr. 1975, was drawn to the fact that the Codex Commission on Food Hygiene had, during the past several years intensified its work on microbiological specifications. The Committee also agreed with the proposal of the U.S. delegation that work in the field of microbiological end product specifications for food products should proceed on the basis of need and demonstrated health hazards, combined with the availability of expert recommendations on microbiological standards and methodology. It was also agreed that this approach should guide the Committee in this field, and the Secretariat was requested to draw the attention of the Commission to the procedure at the next Session of the Commission. At the Eighteenth Session (1976), the Committee considered the draft code of hygienic practice for dried milk which had been prepared by the Australian delegation. The U.S. and several other delegations concluded that the detailed movement went far beyond what was needed. The Committee accepted the Australian delegation's offer to re-write the draft code.

3-A SANITARY STANDARDS

Early History

The present use of sanitary stainless steel equipment for the production and processing of milk and dairy products has been an evolution of at least eight decades. Early investigators and inspectors were aware of the influence of the equipment upon the sanitary quality of the milk at the point of production, transportation, storage, processing, and packaging. Prior to 1920 the only materials available to the dairy equipment manufacturer were iron, steel, copper, glass-lined brass, tin, and the like. These metals, when used in the construction of dairy equipment, had short life spans and in many cases adversely affected the quality of the milk or dairy product. During the 1920's, some nickel alloys were developed and used in certain dairy equipment; the 1930's saw the wide adoption of stainless steel in the manufacture of equipment where direct contact with the product was involved.

In the five decades since stainless steel was first used in the dairy industry, plant operators and sanitarians have made it the standard for dairy product contact surfaces. Stainless steel possesses the attributes for trouble-free, long-term performance under plant operating conditions.

A material for dairy product contact surfaces must be nontoxic, nonabsorbent, readily cleanable, corrosion resistant, and should not impair the flavor and stability of dairy products. Strength and good fabricating characteristics, plus a gleaming, sanitary appearance, are also important. Stainless steel meets all of these requirements.

While often referred to as stainless steel, it is more accurate to use the plural, stainless steels, since it is not a single alloy, but rather a related family of iron-base alloys which have in common the key element, chromium. The importance of this element stems from the fact that the corrosion resistance of steel increases sharply as chromium content increases.

The steels classified as stainless contain about 12 percent chromium, with those used by the dairy industry containing substantially more than the minimum amount of chromium as well as other beneficial elements. For example, the so-called "18-8" stainless steels, used in dairy equipment, have about 18 percent chromium and 8 percent nickel.

Before the 3-A Sanitary Standards concept became a reality, the numerous local and State milk ordinances each had a different sanitary code. Sanitarians applied varying sanitary requirements to the dairy equipment they approved. There was considerable disparity between locally enforced standards. Under these circumstances, many misunderstandings and disagreements developed between sanitarians, manufacturers, and users. Different opinions about sanitary design and lack of a common language resulted in differing interpretations in the application of sanitary principles and procedures. Thus, many kinds of equipment were custom-made to meet the requirements peculiar to each health jurisdiction.

The Meaning of a 3-A Sanitary Standard

A 3-A Sanitary Standard for dairy equipment is a voluntary standard, developed by conferees representing sanitarians, equipment fabricators, dairy processors, and the U.S. Public Health Service (21, p. 260). It covers features of sanitary design for an indicated item of equipment or process.

A 3-A Sanitary Standard sets forth criteria for: (a) the materials used for construction of the piece of dairy equipment, (b) the fabrication and design of various parts, and (c) its construction, including appurtenances, access for inspection, finish of the material and other essential elements evaluated from the standpoint of sanitary performance, use and maintenance.

Origin of the Designation "3-A"

In the 1920's two trade associations and one professional association formulated uniform standards for fittings used on milk pipe lines. The trade groups are now known as Milk Industry Foundation and Dairy and Food Industries Supply Association; the professional group is now known as International Association of Milk, Food and Environmental Sanitarians. The standards for fittings evolved in those early days became popularly known as "3-A" standards. Since 1944, every major dairy processing group and the U.S. Public Health Service have participated in the formulation of the voluntary standards, which are still referred to as 3-A Sanitary Standards.

Development of a 3-A Sanitary Standard

Standards are formulated by the 3-A Sanitary Standards Committee, which meet twice a year in odd-numbered years and once a year in even-numbered years (when the Food and Dairy Industries Exposition is held) (20, p. 260). The members are:

1. The Committee on Sanitary Procedures of International Association of Milk, Food and Environmental Sanitarians.

2. The Sanitary Standards Subcommittee of the Dairy Industry Committee representing the following associations of processors--American Butter Institute, American Dry Milk Institute, Evaporated Milk Association, International Association of Ice Cream Manufacturers, Milk Industry Foundation, National Creameries Association (1950's until mid 1960's), National Cheese Institute, and Whey Products Institute (starting in 1971), and also representing the association of equippers and suppliers, Dairy and Food Industries Supply Association (DFISA).

3. Members of the Dairy Sanitation Section, Dairy and Lipids Products Branch, USPHS/FDA. (Formerly, Milk and Food Program, Division of Environmental Engineering and Food Protection Services, USPHS).

The Dairy Division, Agricultural Marketing Service, USDA, accepted an invitation in 1955 to participate in the deliberations and development of 3-A Standards. For most of the past 20 years, two representatives of the Dairy Division have had an active role in the program, one being assigned to the sanitarians and the other to the users group. The original acceptance was on the basis of the Dairy Division representatives(s) serving on the appropriate committee as a participating observer without vote. Since 1972 the Dairy Division representative working with the sanitarians has enjoyed voting rights by virtue of being a member of the Committee on Sanitary Procedures of International Association of Milk, Food and Environmental Sanitarians.

At the outset, 3-A Standards were developed for the Grade A fluid milk processing operations. After 1955, when USDA representatives became participants, they were instrumental in expanding the 3-A Standards to equipment used in the manufacture and processing of dry milk, evaporated milk, and the like.

Since the late 1950's, the American Dairy Science Association and the National Milk Producers Federation have been represented at the meetings of the Sanitary Standards Committees.

The primary suggestion for a 3-A Sanitary Standard may come from anyone-- public health officials, dairy processors, or equipment manufacturers (20, p. 261). The suggestion may be communicated to any of the groups participating in the 3-A program, and they will pass it on to the Steering Committee of the 3-A Sanitary Standards Committees. If the suggestion is considered by the Steering Committee to have merit and timeliness, it is passed on in due course to the Technical Committee of Dairy and Food Industries Supply Association. The Technical Committee appoints a Task Committee of representatives of all known manufacturers of the equipment involved in the suggestion. The Task Committee develops a tentative draft of a standard which is sent to the appropriate committees of the Dairy Industry Committee, the International Association of Milk, Food and Environmental Sanitarians, and the Dairy Sanitation Section, Dairy and Lipids Products Branch, USPHS/FDA.

It should be noted that in these and subsequent stages of the formulation procedure, DFISA does not act through, or as a part of, the Dairy Industry Committee, but acts separately as the medium through which the views of the equipment fabricators are presented. The three groups to which the tentative draft of a standard is presented by the DFISA Task Committee suggest changes--often many changes. Sometimes they even request a complete redraft of the tentative standard which they have received. Their suggestions and recommendations are returned to the DFISA Task Committee, which adopts them or seeks a common ground for further consideration by all the groups.

Usually, considerable re-drafting is necessary before a tentative standard merits discussion at a meeting of the 3-A Sanitary Standards Committees. Frequently, even after a tentative sanitary standard has progressed that far, it may be sent back to a Task Committee for further work. If the tentative standard is agreed to by all participating parties at such a meeting, then it is formally approved by:

1. The Chairman of the Committee on Sanitary Procedures of the International Association of Milk, Food and Environmental Sanitarians;

2. A representative of the U.S. Public Health Service/FDA.

3. The Chairman of the Sanitary Standards Subcommittee of the Dairy Industry Committee; and

4. The Chairman of the Technical Committee of the Dairy and Food Industries Supply Association.

Within a few months after a new or modified 3-A Sanitary Standard is signed, it is published in the Journal of Milk and Food Technology; generally it becomes effective one year after signing. Reprints are circulated to all persons involved. Additionally, copies of each 3-A Sanitary Standard are maintained on file in the national headquarters of the major trade groups and are always available to any interested party.

The 3-A Sanitary Standards are developed by committees consisting of individuals specializing in their particular sphere of operation. They are selected from various companies and parts of the country to achieve adequate balance and to reflect different geographic considerations. The participating individuals know the technical problems of equipment fabrication and cleanability, processing, and the hazards of possible product contamination.

Sanitary standards initially pertained to equipment used solely in dairy plants, but starting in 1950, they began to apply to dairy farm equipment as well.

In the late 1950's, development was started on specifications and criteria for rubber and rubber-like materials which are used in specified equipment applications. These standards were finalized in 1963 and were followed a year later by standards for multi-use plastic construction materials.

3-A Sanitary Standards--Pathfinders

The dairy industry, without question, was years ahead of other branches of food processing when they established the 3-A Sanitary Standards program for dairy equipment over 30 years ago. Unlike other industries, it acted in anticipation of, rather than in response to, a public need. The 3-A Standards brought about the use of standardized equipment in place of custom-made equipment.

Sanitary codes issued by regulatory agencies are often based on 3-A Standards. Codes of the U.S. Public Health Service/Food and Drug Administration, including the 1965 revision of the Grade A Pasteurized Milk Ordinance, refer to 3-A Standards as being in compliance with the Ordinance. The 1975 "General Specifications for Dairy Plants Approved for USDA Inspection and Grading Service" give full recognition to 3-A Sanitary Standards, as did the documents published in 1967 and 1955, and the 1968 Standards for the Manufacture of Frozen Desserts, recommended by the U.S. Department of Agriculture to State regulatory agencies.

3-A pioneered the criteria for the suitability and acceptance of multi-use plastics. The impact of the 3-A plastic standards has been acknowledged in virtually every segment of the food industry.

While 3-A Sanitary Standards are beneficial to the manufacturer, user and sanitarian, the real benefit is to the general public. U.S. dairy products are the safest and healthiest in the world, and 3-A Sanitary Standards play an important role in that achievement.

3-A Accepted Practices

In addition to the standards, which generally apply to a single piece of equipment, the 3-A Accepted Practices, instituted in the 1950's, are formulated for various methods of operation. An Accepted Practice usually involves the coordination of a number of pieces of equipment in a processing system, such as product pipe line cleaning systems.

3-A Sanitary Standards Symbol Administrative Council

In 1955 the 3-A Sanitary Standards Symbol Administrative Council, frequently referred to as "The 3-A Symbol Council," was formed to authorize manufacturers to use the 3-A Symbol on complying equipment (20, p. 262).

There are two possible ways a prospective buyer or inspecting sanitarian can determine whether a piece of equipment complies with existing 3-A Sanitary Standards: (a) the buyer or sanitarian can look for a 3-A Symbol, which may be affixed by the manufacturer to equipment now covered by existing standards, provided the manufacturer has received authorization from the 3-A Sanitary Standards Symbol Administrative Council for a specific

piece of equipment; or (b) if the symbol is not readily discovered, the buyer or sanitarian can inquire of the equipment manufacturer whether the equipment complies with the existing pertinent 3-A standard, and he can obtain copies of the relevant standard or standards against which to carefully check the equipment himself. Alleged violations, if any, are reported to the Council by sanitarians, users, or competitors.

The 3-A Symbol Council is made up of eight members: four are representatives of the International Association of Milk, Food and Environmental Sanitarians; two are representatives of processors, chosen by the Dairy Industry Committee; and two are representatives of equipment manufacturers, chosen by the Dairy and Food Industries Supply Association.

Under carefully developed bylaws, the 3-A Symbol Council operates as follows:

1. Receives and processes applications from equipment manufacturers desiring to use the 3-A Symbol.
2. Grants authority for the use of the 3-A Symbol on dairy equipment which is acceptably certified by the manufacturer to comply with applicable 3-A Sanitary Standards.
3. Publishes the names of manufacturers to whom, and for which types of equipment, such authority has been granted.
4. Investigates, and takes appropriate action, in instances of alleged improper or unauthorized use of the 3-A Symbol.

Manufacturers desiring to apply the 3-A Symbol to their equipment are required to file with the Secretary of the Council, separate formal applications, for each type of equipment. Each application must be accompanied by full data and sworn certification and also by an application fee for the authorization (currently \$25.00 for each type of equipment).

Authorizations are valid for one year and may be renewed, except in the event that the existing 3-A Sanitary Standards have been amended; in that case, a new application must be filed.

Names of manufacturers to which authorizations have been issued are published bi-annually in the Journal of Milk and Food Technology. Reprints of this list are available on request to all interested parties.

Dairy equipment manufacturers first displayed the 3-A Symbol at the Food and Dairy Industries Exposition in Atlantic City in 1956.

THE COLLEGIATE DAIRY PRODUCTS EVALUATION CONTEST³

Early History

The first Collegiate Dairy Products Evaluation Contest was held in Springfield, Mass., in 1916, in conjunction with the National Dairy Show sponsored by the National Dairy Association. Nine colleges were represented in the contest. Butter was the only product judged at that time; milk and Cheddar cheese were added in 1917. Ice cream was introduced in 1926, cottage cheese in 1962, and yogurt in 1977.

In 1916, the contest was called the "Students' Butter Judging Contest," and the next year the "Students' National Contest in Judging Dairy Products." Later it was known as the "Collegiate Students' International Contest in Judging Dairy Products," and in 1968, the name was changed to "Collegiate Dairy Products Evaluation Contest."

Professor W.P.B. Lockwood, University of Massachusetts, Amherst and S.C. Thompson and William White, Dairy Division, Bureau of Animal Industry, USDA, were instrumental in carrying out the contest in 1916 and 1917, and restaging it in 1919 (no contest in 1918 due to World War I).

This project witnessed many frustrations and handicaps during the formative years, but progress and growth followed, particularly with dairy industry support and participation. The number of entries reached 10 for the first time at Milwaukee in 1924. It was not until 1938 at Cleveland that the entries broke the 20 barrier. Only once during the 42 contests (1930-1976) did team entries fall below 15 (1939, San Francisco). In 1956, at Atlantic City, 33 college and university teams, of three members each, participated; the closest to that record entry was the 30 teams that entered the contest in Chicago in 1958, and the 28 in Chicago in 1952, and the same number in Atlantic City in 1962. The team entry average from 1916-1929 was 9.6, that from 1930-1976 was 21.8, and that for the 55 contests has been 18.8. No contests were held in the years 1942-1946, due to World War II.

From 1916 to 1929 the dairy products judging contests were held in conjunction with the National Dairy Association's dairy cattle show. During this period, the contest was sponsored solely by the American Dairy Science Association and the U.S. Department of Agriculture, with little or no help from the industry which the contest was designed to serve.

Industry Participation

By the late twenties, leaders in the dairy industry recognized the benefits being derived from the contest, which sparked industry participation. Dairy and Food Industries Supply Association, then known as Dairy and Ice Cream Machinery and Supplies Association, became a co-sponsor in 1930 and established its Dairy Industrial Research Program. Since that time, all contests have been held concurrently with the Food and Dairy Expositions and/or with the conventions of the Milk Industry Foundation and the

International Association of Ice Cream Manufacturers. In 1971, the American Dairy Association became a co-sponsor. Since then the contests have been sponsored jointly by the American Dairy Science Association, the Dairy and Food Industries Supply Association, and the American Dairy Association. Since 1973, Dairy Research, Inc., took over ADA's role.

In addition to the Milk Industry Foundation and the International Association of Ice Cream Manufacturers, cooperators included the American Butter Institute, the National Cheese Institute, and the American Cultured Products Institute, who have shared over the years in the furnishing and presentation of awards and, in recent years, have taken a more active part in the planning and staging of the contest, the awards banquet, and/or breakfasts.

In 1928, Professor P.S. Lucas, Michigan State University, conceived the idea of industry participation and Professor Robert B. Stoltz, Ohio State University, foresaw the need for dairy industrial research. Together with Professor Howard B. Gregory, Purdue University, Roberts Everett, DFISA, and a committee headed by K.W. Schanta, DFISA president, they made the plans and laid the groundwork. Today, the Collegiate Dairy Products Evaluation Contest enjoys full industry-wide support.

Co-Sponsor Responsibilities

The American Dairy Science Association, through its Dairy Products Evaluation Committee, is responsible for contest rules, handling entries, credentials, hotel reservations and the like. Since the contest superintendent is a member of the ADSA Committee, ADSA is indirectly responsible for conducting the contest in accordance with the rules.

Dairy and Food Industries Supply Association provides a \$300 travel allowance for each team entered in the contest. This team grant is in lieu of the Dairy Industry Research Fellowships which the Association awarded to contest winners from 1930 through 1967. Also, Dairy and Food Industries Supply Association plans and stages the contest and, in Exposition years, furnishes the contest site. DFISA also cooperates with other associations in the presentation of awards and, through the members, furnished most of the needed equipment and supplies. Furthermore from 1930 through 1970, DFISA provided the funds and services now assumed by farmer supported United Dairy Industry Association (UDIA).

In 1971 and 1972, the American Dairy Association allocated the funds for staging and publicizing the contest, air shipping the samples, providing secretarial and clerical help, and all other expense items not furnished gratis by other organizations. The Dairy Research, Inc., took over ADA's role in 1973. The UDIA organizations also assist with staging the impressive awards breakfast or awards banquet honoring the contestants and coaches, and shares with the other cooperating associations in the presentation of awards.

From the beginning, the superintendent of the contest has been an official from USDA. In recent years an assistant superintendent from USDA has also served.

Dairy Industrial Research Fellowships

The enthusiasm for dairy products quality evaluation was given considerable stimulation in 1930 by the establishment of six Dairy Industrial Research Fellowships by the Dairy and Food Industries Supply Association. In the 1960's, government grants and loans for graduate studies were becoming more plentiful and the number of fellowships was gradually reduced to two. DFISA discontinued the fellowship program in 1968 and, recognizing the increasing financial burden to the colleges for student training and travel for contest participation, is now providing a travel allowance to each team. During the period 1930 through 1967, 107 Dairy Industrial Research Fellowships were awarded to as many individuals in 28 different colleges. The great advancement of the dairy and food industries throughout the 1930's, 40's, and 50's was due in no small part to the DFISA Dairy Industrial Research Program.

Foundation Committees in Cooperation

The Collegiate Dairy Products Evaluation Contests, the dream of the Official Dairy Instructor's Association (parent of the American Dairy Science Association), have been guided by committees of ADSA and DFISA, working independently or together. The first ADSA committee was appointed prior to 1916; that of DFISA in 1928.

The ADSA contest committee inaugurated the contest and nurtured it during the 13-year growth period prior to 1930. Both ADSA and DFISA committees guided the contests from 1930 to the present.

In the early period of the contest, another ADSA committee, the Score Card Committee, aided in the development of the contest. The score card and judging committees worked separately, yet aided each other in the common goal of improving the quality of dairy products.

The Score Card Committee began in 1915, functioned for nearly two score years, and then was dissolved, having virtually completed its assignment. Following a 5-year lag, the Score Card Committee was reinstated in 1939, with added emphasis placed on farm and dairy inspection. It was phased out during the war years.

A Sub-Committee of the Dairy Products Judging Committee, Manufacturing Section, was appointed in 1955 to develop a scorecard for nonfat dry milk. The dry milk products scorecard, including the scoring guide and definitions of terms, was submitted by the sub-committee of the committee on judging dairy products and approved by the Association in June 1958. The sub-committee remained active until June 1959 when it was terminated.

The 1958 report of the Committee on Butter, Manufacturing Section, presented the major problems of the butter industry and recommendations for their solutions. The report included an extensive paper, "A Study of Butter Characteristics and Grading Results Based on USDA Gradings 1957," prepared by Edward Small and Floyd E. Fenton, Dairy Division, Agricultural Marketing Service, USDA.

Contemporary Committees

The Contest and Fellowship Committee of the Dairy and Food Industries Supply Association, its oldest standing committee, has worked closely with the American Dairy Science Association's Dairy Products Evaluation Committee since 1928 to help develop and advance the Collegiate Dairy Products Evaluation Contest in all of its spheres of operation and influence. Recently, the dairy farm-supported United Dairy Industry Associations--ADA and DRINC--have joined these two old-time groups to enhance the best interests of the contest.

Some Rule Changes

In 1962, out of fairness to schools with low enrollments, or when a team member drops out at the last minute, the contest rules were changed to allow entry of one or two individual contestants when a full team of three was not available. Several schools have made use of this rule.

Another significant change in the contest has been the participation by women. This was a natural response, as more and more women were enrolling in dairy and food science departments and were being accepted by the industry. At least one all-girl team has been entered in the event. The proficiency of women in judging dairy products has been demonstrated again and again. On three occasions girls have taken top honors in judging all dairy products.

In 1970, the Committee, with help from the DFISA Committee, conducted a survey among two-year agricultural schools to determine the extent of their dairy and food science curricula. As a result, the contest rules were changed in 1971 to permit contest entry by teams from two-year agricultural colleges whose credits are acceptable for transfer to a four-year college. Five of the two-year colleges have entered teams.

In 1976, a new scoring system was inaugurated (see p. 256).

The number of samples for each of the products, starting with the 1977 contest, was to be reduced from ten to eight.

Standardized Pattern of Quality Evaluation

Much of the success of dairy products evaluation depends upon the establishment of standards having a continuity from year to year. The placing of scores upon dairy products used in the contest has had a profound and salutary influence in raising the quality level of dairy products nationally.

The student judges or evaluators are taught and are required to place a numerical rating on a contest sample and also describe the flavor and/or physical attributes on a qualitative and quantitative basis. This kind of training, on a competitive basis and applied to a broad quality range, is

extremely helpful to the student in any phase of the dairy industry. It also has broad application in the food processing industry. Moreover, the student evaluator benefits considerably in exchanging ideas and views with his counterparts from many sections of the country. Many of these students become leaders in the dairy industry, which has long enjoyed first place among all food industries in its devotion to, and insistence upon, quality.

To help develop a standardized pattern of quality evaluation, the all-products judge checks the official scores and criticisms of each of the eight samples (ten samples prior to 1977) for each of the products, which have been previously determined by the official judges. Three coach judges are selected for each of the products to check the official scores and criticisms. If there is a disagreement with the official scores the superintendent of the contest becomes the final judge. All samples are scored and criticized in accordance with the prevailing scoring-guide and contest rules. This method of arriving at the official scores and criticisms assists coach judges in working with the student participants.

Devotion to Contest

Long records of contest participation are held by many schools. A total of 50 United States and Canadian schools have entered the 55 contests held from 1916 through 1976. Five of those schools have entered 40 or more contests. Mississippi State University, with 43 contests to its credit, holds the longest continuous record, having entered every contest since 1927; and Connecticut with 41 entries, did not miss a contest from 1939 through 1972. University of Nebraska has entered 45 of the contests, 35 of them with the same coach. Iowa, with 46 entries, has missed only five contests since 1919. Ohio State University leads all schools with 50 entries, missing only the 1927, 1970, and 1972 contests.

C.J. Babcock, USDA, served 13 years as an official judge, and from 1941 until his death in 1958 served as Superintendent of the Contest.

Several persons have had records of long contest participation in one way or another. Some have served for years as official product judges, including several members of the Inspection and Grading Branch, as coaches of student judging teams, or rendered service in staging the contest and in handling the publicity.

The Superintendents

A member of the U.S. Department of Agriculture has superintended each of the contests since its inception. The Department recognizes the value of the contest as a means of improving the quality of dairy products and of maintaining a close liaison with the agricultural universities. The superintendent is responsible for publishing and enforcing the official rules of the contest and also for the selection of the official dairy products judges.

At the time of the contest, teams report directly to the superintendent, are assigned numbers, and are given last minute instructions.

Ten samples each of milk, butter, cheddar cheese, vanilla ice cream and cottage cheese are evaluated by each contestant. The contestant enters his scores and criticisms on the score cards provided. The score cards are then graded by comparing the contestants' evaluations with official scores and criticisms previously determined.

There have been only seven superintendents of the contest, 1916 to 1977, three of whom were members of the AMS Dairy Division. Four members of the AMS Dairy Division served as assistant superintendents, 1950 to 1977.

New Scoring System

The Committee on Evaluation of Dairy Products had been considering for some time the need to revise the rather cumbersome numerical scoring system used in dairy products evaluation. Work on the revision began in 1969. A revised system was adopted at the 1975 annual meeting of the American Dairy Science Association, held at Montreal, Canada. The new system provides for a 1-10 point flavor score for all products; a 1-5 point body and texture scoring range; and a 1-5 point appearance and color scoring range. All scorings were to use whole numbers only. The new score card was used for the 1976 contest held at Atlantic City.

General

The primary objective of the contest's pioneers was to stimulate interest in the improvement of quality of dairy products on the part of educational institutions and industry. Nelson and Trout in their book, Judging Dairy Products, state that:

Dairy Products judging contests are sponsored to aid students interested in dairy products to become more proficient in judging and evaluating the qualities of those products. The contests offer the student an opportunity to put his training to a test and to furnish an incentive for further study. Students who are well trained in judging are in a position to be of greater service to the industry. They are more ably prepared to improve the quality of dairy products through the detection of flavor defects which often meet the consumers disapproval (61, p. 434).

Furthermore they state that contests have furnished the student an opportunity to:

1. Evaluate his training, knowledge, and experience in the judging of dairy products.
2. Observe the quality of dairy products in other sections of the country and note the standards of quality recognized by competent judges.

3. Test his ability to arrive at conclusions within a definite period of time and under a new environment.

4. Meet similarly trained students in wholesome competition and in a friendly environment; gain the educational benefit of travel.

5. Obtain an out-of-classroom vision of the size and scope of the industry; gain inspiration by a view of the biennial Food and Dairy Industries Expo.

6. Kindle the desire to lead in a chosen field.

In a survey of former dairy products-judging contestants from 1930 to 1956 inclusive, conducted by the committee on Judging Dairy Products, American Dairy Science Association, about 90 percent of the 574 respondents made statements or wrote at length in support of the merits of the Collegiate Students International Contest in Judging Dairy Products. The following are two quotes from former contestants; they serve to indicate the opinion of many students on the merits of the contest:

1. *Taste evaluation is of great importance in the food business and the contest is an excellent stimulant in developing this ability.*
2. *The contest, together with all its ramifications, has been a prime factor in standardizing terminology and methodology in the grading and evaluation of quality of dairy products in the United States (78, p. 93).*

Many former students have held key positions in government, industry, and educational institutions with major responsibilities connected with quality evaluation and quality assurance of dairy and other food products. The contest has been an important factor in the upgrading and standardization of the quality of dairy products in the United States.

NATIONAL LABELING COMMITTEE⁴

Early History

The dairy industry and regulatory agencies for many years were aware of the confusion that existed throughout the country because of non-uniformity in labeling requirements of the various jurisdictions. The problem was compounded by the lack of uniformity in interpretation and enforcement policies on labeling between and within States. The consuming public was likewise confused in traveling from State to State and finding the same product labeled differently in different States.

In the light of these obvious conditions and situations, a number of persons representing the dairy industry and regulatory agencies, in 1957, asked the Executive Board of the International Association of Milk and Food

Sanitarians to study the problem. It was shown that the industry bore much unnecessary expense because of the need to maintain a multiplicity of container inventories to meet the labeling requirements of Federal, State, and local jurisdictions. Some areas of the country were very active in label control, while others were paying little or no attention to labeling. Many control officials wanted to have guidelines or standards to assist them in making judgments as to whether a particular label complied with the regulations. The nature and magnitude of the problem was of such importance that it seemed to justify nationwide attention and action.

After due consideration the Executive Board of the International Association of Milk and Food Sanitarians, at its annual meeting held in Louisville, Ky., 1957, asked the Committee on Ordinances and Regulations to study the problem during 1958. At the 1958 meeting of the IAMFS in New York City, the subject was reviewed and discussed by the Committee, chaired by Donald H. Race.

This Committee felt that the work of the 3-A Sanitary Standards Committee had been so outstanding and the results so far reaching that it might be well to pattern their work after the 3-A Committee and to approach the problem in a similar manner. Don Race, Chairman of the Committee, was requested to investigate the organization of a permanent committee on the same basis as the 3-A Sanitary Standards Committee. During the ensuing year, he was assisted by the legal staff of the Dairy Industry Committee in determining the legal aspects of such an organization.

Meanwhile, the program committee for the National Conference on Interstate Milk Shipments became interested in the problem of non-uniformity in labeling requirements. Its interest was that non-uniformity in labeling acts as a trade barrier for the free flow of milk and its products. This subject was given priority and a panel discussion was arranged at the formal meeting of the Conference in Apr. 1959. Participants from local, State, and Federal levels joined with the dairy industry in pointing out the economic and public health need of uniformity. The Conference membership asked that a committee from their organization be appointed to work with the International Association of Milk and Food Sanitarians in bringing about realization of the goal of uniformity in labeling.

In order to bring the problem directly to the membership of the International Association of Milk and Food Sanitarians, a panel discussion was arranged for its 1959 meeting in Glenwood Springs, Colo. This panel, made up of dairy industry and regulatory personnel, stressed the seriousness of the confused and non-uniform situation. The need for action was clearly and forcefully presented.

John J. Sheuring of the University of Georgia, the new President of the International Association of Milk and Food Sanitarians, opened the meeting and read the preamble and resolutions submitted by the Committee on Ordinances and Regulations and adopted by the Executive Committee.

A problem which concerned the Committee since the beginning of the project was the development of a sound, workable plan for all efforts and activities of the various agencies and groups interested in achieving uniformity in labeling. They wanted one coordinated move toward reaching this objective. A step forward was made in 1958 when the Committee recommended handling this project on a regional basis, with the work of the various regions coordinated through a group or organization such as the Committee on Ordinances and Regulations.

Donald H. Race, Chairman of the Committee on Ordinances and Regulations, stated that the purpose of the meeting was to discuss and develop further the organizational plan, the method of financing, the selection of a temporary chairman and a temporary secretary.

Immediately after the Glenwood Springs meeting, active work began. The appropriate Federal agencies were contacted by A.C. Dahlberg, Advisor to the Board of the Dairy Products Improvement Institute (DPII), and Franklin Barber, Immediate Past President of IAMFS. These men outlined the objectives of the program so that there would be no conflict with these Federal agencies. Cooperation and assistance in the project was assured. The Committee on Ordinances and Regulations then sponsored a meeting of representatives from 20 national and international associations and three federal agencies in Chicago (Oct. 1960). The need for uniformity was universally agreed upon at this meeting. The 3-A Sanitary Standards concept received favorable support.

The group in Chicago expressed strong feelings about the actual work required to carry out the objectives and functions of such a project. A.C. Dahlberg was asked to serve as temporary chairman and Ernest B. Kellogg, Director of Technical Services of the Milk Industry Foundation, agreed to serve as temporary secretary.

Establishment of National Labeling Committee

A Subcommittee on Organization of a National Committee on Uniform Labeling was appointed. At three meetings of the Subcommittee, bylaws and functioning of the Committee were developed. A Finance Committee, headed by William V. Hickey of the Paper Cup and Container Institute, Inc., and Past President of IAMFS, was appointed to explore ways and means of financing the work. The Finance Committee decided that only national associations of dairy products manufacturers, processors and distributors, and national associations of manufacturers and distributors of dairy machinery and supplies would be asked to support the project. The Committee gained financial support from these organizations; this gave the effort a good start.

Financial contributors included the: Milk Industry Foundation, International Association of Ice Cream Manufacturers, Dairy Products Improvement Institute, Paper Cup and Container Institute, Institute for Better Packaging, National Association of Sanitary Milk Bottle Closure Manufacturers, and Suppliers of Single Service Milk Containers and Milk Ingredients.

Dahlberg and the office staff of DPII spent much time and effort on the project during the period of organization. In Feb. 1962, the DAPII Board agreed to permit the use of the Institute office as headquarters for the operation and its chief employee to implement the labeling project as directed by the National Labeling Committee (NLC). It was felt that someone experienced in regulatory work should be employed to do the detailed work of the labeling project. Harold J. Barnum, Chief Milk Sanitarian for the City and County of Denver, Colo., was then selected to serve as Executive Secretary of the Institute with the understanding that about three-quarters of his time would be devoted to the labeling project. Barnum began his duties Apr. 1, 1962.

The National Labeling Committee held its first meeting in Atlanta, Ga., June 15, 1962. Representatives of 17 national and international professional and industry organizations met to elect officers, adopt bylaws and plan a constructive program. Officers and Executive Committee members elected at the Atlanta meeting were:

Chairman - M.W. Jefferson, Virginia Dept. of Agriculture

Vice Chairman - Shelby Johnson, Kentucky State Health Dept.

Secretary - Harold J. Barnum

Treasurer - Ernest B. Kellogg

Executive Committee:

Morton S. Hilbert, University of Michigan

William V. Hickey, Paper Cup and Container Inst.

William H.E. Reid, University of Missouri

A step by step operating procedure for establishing voluntary uniform labeling standards was presented at a National Labeling Subcommittee meeting held in Washington, D.C., Dec. 4-5, 1962. It was a modified version of the 3-A Sanitary Standards Committee operating procedure.

The National Labeling Committee at its Apr. 15, 1963, meeting in Memphis, Tenn., agreed to recommend a uniform coding system for the identification of plants processing fluid milk, fresh milk products, and frozen desserts. The IBM numerical Code for States was adopted, since it was the most widely used national code designation. For States where a change of law was required, a suggested enabling act was offered for guidance.

For the sake of immediate recognition of the purpose of this code, the National Labeling Committee recommended that the State number always show two digits (including a zero for the first nine States) followed by a hyphen between the State and plant numbers.

The National Conference on Interstate Milk Shipments, at its meeting in Memphis, Tenn., in Apr. 1963, passed a resolution recommending the nationwide use of the NLC proposal. This Conference also requested the USPHS to include in the quarterly publication, "Sanitation Compliance Ratings of Interstate Milk Shippers," the plant identification code numbers of the listed shippers.

Harold J. Barnum served officially as Secretary of the NLC until May 1, 1963, when he returned to the City of Denver Health Department. At the same time, the Dairy Products Improvement Institute office in Ithaca, N.Y., was closed. However, during the next several months, Barnum attempted to carry on the duties of the Secretary's office. H.L. Thomasson, Executive Secretary, International Association of Milk, Food and Environmental Sanitarians, through a Memorandum of Understanding between the NLC and IAMFS, was appointed Secretary of NLC, to replace Barnum, effective Jan. 15, 1964, with headquarters at Shelbyville, Ind.

Edward Small, Chief, Standardization Branch, Dairy Division, AMS, was a member of the Committee on Ordinances and Regulations, IAMFS (1955-1963), and served on the National Labeling Committee from its conception until his retirement in the summer of 1963. Floyd E. Fenton, successor to Edward Small, was appointed to the NLC in the summer of 1963. Fenton provided continuity on the part of USDA in the work of the National Labeling Committee.

The next meeting of the National Labeling Committee was held in Dodge City, Kans., July 24, 1963. At this meeting, consideration was given to reorganizing the National Advisory Committee on Coordination of Definitions, Standards and Labeling Requirements for Dairy Products. John F. Speer, Jr., Executive Assistant, Milk Industry Foundation, outlined the suggestions and details in the proposed reorganization.

At the National Labeling Committee meeting Jan. 14-15, 1964, Washington, D.C., the bylaws were modified and expanded. They stipulated that the purpose of the NLC was to: "promote the voluntary adoption and implementation of uniform definitions, standards, and required labeling information for dairy products by local, state, and federal regulatory agencies and to aid in resolving conflicting interpretations thereof."

The membership of the National Labeling Committee was divided into three sections, viz.: regulatory, industry, and advisory. The representatives of the advisory section served in a non-voting capacity.

The bylaws also provided that an Executive Committee be charged with the responsibility of formulating objectives and policies consistent with the stated purpose of the NLC.

The members of the Executive Committee were to consist of the Chairman, the Vice Chairman, the Executive Secretary, and the Treasurer. The Industry Section and the Regulatory Section were each to appoint its own section chairman, vice chairman, and recording secretary, and such persons to be members of the Executive Committee.

Operating Structure of the National Labeling Committee

At the National Labeling Committee meeting in Denver, Colo., June 24, 1964, it was decided that the operating structure and procedures were to be patterned after the 3-A Sanitary Standards Committee.

H.L. Thomasson resigned as Secretary of the National Labeling Committee on Jan. 1, 1965, and was replaced by John F. Speer, Jr. The office was moved from Shelbyville, Ind., to the offices of the Milk Industry Foundation, Washington, D.C.

Model Packaging and Labeling Regulation

During 1964-1967 the National Labeling Committee worked on the development of a model packaging and labeling regulation under the direction of its Chairman, M.W. Jefferson, Virginia Department of Agriculture, and Vice Chairman, Shelby Johnson, Kentucky Department of Health.

The work was given further stimulation by the passage of the Fair Packaging and Labeling Act of 1966. Under this Act, fluid milk and fluid milk product packages were required to conform to the new Federal regulations by July 1, 1969. Many believed that the provisions of the FPL Act as applicable to dairy products were formulated from the recommendations established by the NLC.

The National Labeling Committee document known as the "Model Regulation and Law--Fair Packaging and Labeling Regulations for Fluid Milk and Fluid Milk Products" was published in Mar. 1968, amended in Aug. 1968 and again in Aug. 1969. The NLC model regulation conforms in all respects to the Fair Packaging and Labeling Regulations and the recommendations of the National Conference on Weights and Measures. The Model Regulation and Law includes an appendix containing a listing of milk and milk products covered by this regulation.

The National Labeling Committee acknowledged gratitude to Harold E. Thompson and other staff members of the U.S. Public Health Service, to Floyd E. Fenton, Dairy Division, USDA, and staff personnel of FDA, whose advice and counsel were readily available during the preparation of this model regulation.

New Numerical Code for States

The passage of Public Law 89-306, Oct. 30, 1965, authorized the Secretary of Commerce, "to make appropriate recommendations to the President relating to the establishment of uniform Federal automatic data processing standards."⁵ The National Bureau of Standards developed a State Coding System, under this Public Law, contained in the Federal Information Processing Standards Publication (FIPS PUB 6-1), June 15, 1970. The new numerical code is known as FIPS.

The Dairy Inspection and Grading Branch, Dairy Division, AMS, switched from the IBM to the FIPS coding system in the Oct. 1972 issue of the publication, "Dairy Plants Surveyed and Approved for USDA Grading Service."

In early 1973, the National Labeling Committee recommended switching from the IBM coding system to FIPS.

The National Conference on Interstate Milk Shipments voted on May 24, 1973, to adopt the FIPS State coding system effective Jan. 1975. The National Conference further voted to accept either the IBM State code or the FIPS State code in the interim. On Nov. 22, 1974, the Executive Board of the National Conference on Interstate Milk Shipments extended the acceptance of either code to July 1, 1975, to coincide with the new date for compliance with the FDA nutritional labeling requirements. Under both systems a State is assigned a standard two-digit number.

State Adoption

In 1971, 41 States had laws, regulations, or guidelines in line with the Model Regulation and Law concerning Fair Packaging and Labeling of Fluid Milk and Milk Products. The recommendations of the National Labeling Committee were accepted not only by this number of States, but they had also been used by some cities, towns, and localities.

Status of the National Labeling Committee

The Fair Packaging and Labeling Act of 1966, coupled with the subsequent amendments and federal regulations requiring nutritional and ingredient labeling, have somewhat preempted the need for activity by the National Labeling Committee. The Fair Packaging and Labeling Act is administered by the Food and Drug Administration and the Federal Trade Commission. The last formal meeting of the NLC was held in St. Louis, Mo., Mar. 27, 1969. For the past few years the operations of the National Labeling Committee have been on a standby basis.

FEDERAL-STATE RELATIONS⁶

The first Federal-State cooperative agreement covering the inspection and grading of dairy products pertained to service rendered at shipping points in the State of Minnesota in 1924. Similar cooperative agreements were executed in California and Washington in the late 1920's and in Iowa and Nebraska in the mid-1930's.

Federal-State cooperative agreements providing for the inspection and grading of dairy products on terminal markets were first executed in the early 1930's. Before then, the terminal market inspection and grading work was carried on under a straight Federal program or through cooperative agreements with produce exchanges.

Roy C. Potts, in charge of the Dairy and Poultry Products Division, Bureau of Markets, Washington, D.C., and Charles W. Fryhofer, supervisor for the grading of dairy products, New York City, were invited by the Wisconsin Division of Markets in 1920 and 1921, to assist in formulating plans for an inspection service on cheese, and in establishing grade standards for American

cheese to be used by the State Division of Markets. The first meeting they held was on Dec. 6, 1920, in Madison. Other meetings were held in Plymouth in Jan. 1921 and at Marshfield a month later. These meetings did not result in an immediate formulation of an inspection and grading program.

In the late 1920's the Wisconsin State Department of Agriculture expressed an interest in entering into a cooperative agreement with USDA for the Federal-State grading of Cheddar cheese. The major problem appeared to be the lack of a suitable device for branding cheese with the grademark. Early in 1930, a special branding machine, consisting of an electrically heated metal stamp, was developed by John F. Barghausen, technologist of the Bureau of Agricultural Economics, USDA.

Roy C. Potts, Charles E. Eckles, and John F. Barghausen met in Madison on Feb. 28 with representatives of the Wisconsin Department of Agriculture. Representatives of various cheese firms also attended the conference. After preliminary arrangements made at Madison, the cheese-branding machine was successfully demonstrated at several Wisconsin warehouse points.

Plans to cooperate with the Wisconsin State Department of Agriculture in the grading of a large volume of Wisconsin cheese had to be dropped, however, as a result of apparently insurmountable obstacles in conflicting policies of the two departments. It was hoped that eventually the difficulties would be worked out, but this never came to pass.

In 1928, a dairy products inspection and grading office was established in Los Angeles, with the services of O.A. Ghigoile of the California State Department of Agriculture, from Apr. to Oct.

In July 1940 a Federal-State cooperative agreement was entered into with the Wisconsin State Department of Agriculture.⁷ This authorized the use of several Wisconsin cheese graders for the grading of Cheddar cheese offered for sale to the Federal Surplus Commodities Corporation and other Government agencies. The Wisconsin State Department of Agriculture cancelled the agreement, effective Aug. 1, 1942. One reason for the cancellation, according to the State officials, related to the fact that the extra cheese grading workload forced the Wisconsin Department of Agriculture cheese graders to neglect their regular responsibilities, which were to supervise the licensed industry graders.

The cancellation of the cooperative agreement between USDA and the Wisconsin State Department of Agriculture caused an emergency situation for USDA. At this point Harold E. Meister was appointed as a supervisor of cheese grading operations for USDA in the midwest area. His first assignment was to establish an office in Milwaukee, on Aug. 1, 1942. A sufficient number of cheese graders were employed to handle the large volume of cheese grading requests related to the war effort. This transition was executed smoothly and effectively.

During the World War II period, USDA and many states had cooperative agreements covering the inspection and grading of dairy products. Many States actively participated in the sampling and grading of the products.

During the postwar period, State departments of agriculture personnel continued their cooperation in the inspection and grading of dairy products, and since the mid-1950's, some have participated in the USDA plant survey program.

The Agricultural Marketing Act of 1946

The Agricultural Marketing Act of 1946 provides for joint Federal-State operations in the field of research and service work. In developing the basis for joint operations, there is a common understanding that each party to the agreement is charged by law, Federal or State, to assume certain specified responsibilities. Any cooperative effort, the delegation of responsibilities, and the use of individuals, whether Federal or State, must provide for appropriate supervision of qualified personnel and for assurances that the job will be done properly, in compliance with the laws and rules and regulations.

Cooperation with the State Departments of Agriculture, with respect to dairy products standardization activities, began as early as 1919 and has continued since. A prime example of Federal-State cooperation in this area is reflected in the development of the "Minimum Standards for Milk for Manufacturing Purposes and Its Production and Processing Recommended for Adoption by State Regulatory Agencies." This project was conducted during a 4-year period (1959-1963); several 2-day working sessions were held at different locations with a committee of the Dairy Division of the National Association of State Departments of Agriculture. J. Phil Campbell, then Commissioner of the Georgia State Department of Agriculture, chaired a 2-day working session in 1961.

Public Law 87-718

Further interest surfaced in 1962 toward the development of greater involvement in Federal-State relations. Congress enacted Public Law 87-718, Sept. 28, 1962, "to provide further for cooperation with States in administration and enforcement of certain Federal laws."⁸

The Secretary of Agriculture on Dec. 28, 1962, said:

It is consistent with provisions of P.L. 87-718, passed by the last Congress, to further cooperation with States in administration and enforcement of certain laws and other authorizations ... It is in the public interest that wherever feasible Federal and State law be administered so as to avoid duplication of functions, facilities, and personnel, and to attain close coordination and maximum effectiveness and economy.

As a consequence of Public Law 87-718, the Secretary of Agriculture established a Task Force of ten persons, five designated by the National Association of State Departments of Agriculture (NASDA) and five representing USDA, and a nonvoting Executive Director.

S.R. Newell was appointed as Executive Director. The Joint USDA-NASDA Task Force held one meeting in Dec. 1962, and three during 1963. Another meeting scheduled for Nov. 25, 1963, was cancelled on receipt of the news of President Kennedy's death.

The Task Force first met on Dec. 8, 1962, in conjunction with a regular meeting of the Executive Committee of NASDA. Discussions on this occasion were largely exploratory. The Committee agreed to the following statement of objective:

to develop specific guidelines for the highest possible degree of Federal-State cooperation, coordination and implementation of functions and services in areas of mutual concern in order to obtain maximum effectiveness and economy.

S.R. Newell prepared an historical statement on Cooperation Between Federal and State Departments of Agriculture; it was presented to the Task Force at its second meeting, Mar. 2 and 3, 1963. The report proved a good starting point for discussion.

At the March meeting, the Task Force devoted much of its time to drafting a Statement of Policy which would guide program administrators in the joint planning and execution of regulatory and service programs involving both State and Federal interests.

A redraft of the policy statement was critically examined when the Task Force met on May 13, 1963; with some additions and modifications it was approved and presented to the Secretary of Agriculture and the Chairman of the Executive Committee of NASDA for signature.

Policy Statement of Federal-State Cooperation

In order to carry out the general policy of strengthening and improving cooperative relations and operations, USDA and State personnel at all levels are expected to do their full part to develop and maintain harmonious relations with the cooperating agency.

The USDA must meet its obligations in carrying out the laws and programs delegated to it by the Congress. It cannot delegate these responsibilities to the States. The Department, however, seeks the assistance and cooperation of the State departments of agriculture in administration of Federal laws and programs when such State laws or objectives are compatible with the Federal law and when a State department can meet the standards required by the USDA.

Agreements on service and regulatory programs are negotiated between the agencies of the Department having jurisdiction over the particular programs and the State department concerned. Under no circumstances, however, may a cooperative agreement or memorandum of understanding impair the jurisdiction of the Secretary of Agriculture in carrying out his responsibilities under the law. Any delegation of authority under a service or regulatory program must provide for supervision and direction that will adequately protect the USDA in meeting its responsibilities to all the people affected by the law or service program.

With Task Force members in agreement in overall policy, attention turned to factors to be considered in determining the feasibility of joint administration of certain Federal-State programs. These discussions led to the drafting of an "Information Exchange and Development Guide" which was ready for final review and clearance when the Task Force met on Aug. 19, 1963.

W.L. Popham succeeded S.R. Newell as Executive Director of the Task Force in the summer of 1963.

Status of Cooperative Programs (1963)

In mid-January 1963, each agency having cooperative programs with State departments of agriculture was asked to provide information showing the character of each program or project, and the magnitude of the project and the operating procedure.

It is pointed out specifically that while most of the work is conducted in cooperation with State departments of agriculture, all States are not involved in each program and in some, other State agencies are also involved. For instance, in States where there is no department of agriculture, a program may proceed with a college or other State agency, and, in some instances, there may be cooperation with both a State department and a college or other agency.

In the case of dairy products inspection and grading, the work is conducted in cooperation with 46 States, using 113 State department of agriculture employees licensed by the Inspection and Grading Branch, Dairy Division, AMS.

In Louisiana, the inspection and grading work on dairy products is conducted on the basis of a State cooperative agreement; in Indiana and Iowa, in cooperation with the State University. In five of the States (Arkansas, Illinois, Kentucky, Texas and Wisconsin) the inspection and grading work is conducted in cooperation with the American Dry Milk Institute, or the National Cheese Institute.

Report of Joint Task Force on Federal-State Cooperation

On May 5, 1964, the Joint Task Force appointed by Secretary of Agriculture Orville L. Freeman, at the request of the National Association of State Departments of Agriculture, and pursuant to P.L. 87-718, submitted a report of its activities.

Having agreed on a statement of policy, the Task Force turned its attention to ways and means of implementing the views expressed therein. Recommendations were made, taking into account the results of a number of Joint "Program Appraisals" conducted while the Task Force study was in progress. The Task Force recommended that:

1. Program administrators (Federal and State) should review periodically, and strengthen, where possible, procedures for assuring the free exchange of information between Federal and State employees responsible for the planning and execution of programs involving joint interests. Cross deputizing of qualified Federal and State employees should be practiced to the maximum extent consistent with good program management. A broad joint training program should be encouraged, particularly for employees assuming new duties and responsibilities.
2. When rules, regulations, and standards promulgated by agencies in the USDA directly affect State operations or joint endeavors, there should be advance notice and opportunity for consultation with appropriate State officials; the same procedure should apply when comparable actions are contemplated by the States.
3. When a new program of mutual concern is to be initiated either by USDA or by a State, there should be advance notice and opportunity for consultation and planning so as to assure that objectives are clear and that facilities and personnel available at all levels of government will be used efficiently.
4. To the fullest extent feasible, there should be prior consultation when either USDA or the State proposes or introduces legislation which affects the other.
5. Memorandum of understanding and agreements between agencies of USDA and State Departments of Agriculture providing for cooperation in the conduct of programs, including assessment of fees, should be made uniform as far as feasible.

The Task Force Report pointed out that, in a jointly administered regulatory or service program, close cooperation between responsible officials of USDA and their counterparts in the States is a prerequisite to success. To administer interstate regulations fairly and effectively, there must be uniformity in the interpretation of requirements and in the actions taken. The goal is achieved only when State and Federal employees assigned to a particular program have comparable backgrounds in training and experience, and are willing to be part of a regional or nationwide effort. The extent of participation by individual States may vary but, as far as possible, the standard of performance at different levels of responsibility should be uniform. The report made by the Task Force on May 5, 1964, recommended continuation of a joint committee to review and make recommendations for updating policy on changing programs and emerging needs. NASDA endorsed the proposal at its national convention in Aug. 1964.

A report issued in Dec. 1968 was an update of the May 5, 1964, report; it reflected changes that occurred in federal-state cooperative programs.

Federal Assistance Review

On Mar. 27, 1969, President Nixon launched the Federal Assistance Review, a program to:

1. Create a new sense of partnership among the various levels of Government with greater dependence on State and local governments.
2. Streamline and simplify the processes and organizational structures for managing Federal programs, not only for efficiency and economy but also to speed delivery of resources and services.
3. Decentralize the Federal agencies to stimulate greater interagency coordination in the field, and greater collaboration between Federal agencies and State and local governments.

The Secretary of Agriculture ordered a review of the USDA field program structure and delegations of authority to lead to greater and more consistent decentralization of all Federal programs. One of the review projects has as its aim:

To achieve a reasonable balance in Federal and State handling of inspection, grading, and regulatory functions with emphasis on State participation.

Decentralization of Federal Assistance Programs

A project was formulated in 1970 pertaining to the criteria for the decentralization of the Federal-State cooperative programs. It provided that States receive full opportunity to assume a greater share of program activities commensurate with their willingness to accept the responsibility, and their ability to carry them out within the framework of the usual cooperative approach of USDA. In doing so, it was contended that decision making would be brought closer to where delivery of services occur, and that the decision-maker would be more visible and accessible. This program was known as Project No. 4 (Federal Assistance Review). It elaborated the criteria for achieving decentralization, including: program objectives, program accomplishments, program evaluation control and surveillance, disputes, finance, personnel and facilities.

Expanding State Participation

As a followup to prior directions, the Secretary of Agriculture set forth procedures for expanding state participation in all programs of the Department of Agriculture.

In connection therewith, Harold E. Meister and Edwin F. Garbe initiated greater cooperation with the several States. They traveled to Columbus, Ohio, and Lansing, Mich., on June 23 and 24, 1970, to discuss with State officials their comments on the proposed revision of the "Manufacturing Grade Milk Standards," and ways and means for effecting greater State cooperation in USDA inspection and grading programs. Similar visits were made during 1970 to many other State departments of agriculture.

USDA-NASDA Task Force Meeting

A USDA-NASDA Task Force meeting was held in Washington, D.C., July 6-7, 1970, with Under Secretary of Agriculture J. Phil Campbell presiding as co-chairman representing USDA, and Director B. Dale Ball, Michigan, co-chairman representing the National Association of State Departments of Agriculture (NASDA).

On the topic of dairy grading programs, Director Ball recommended the following breakdown of responsibility between the federal and the state:

Federal Responsibilities

1. Establish standards and guidelines in cooperation with state representatives.
2. Train and approve state grading personnel.
3. Establish and maintain random survey procedure to assure compliance with standards.
4. Provide "Block-Grants" to states approved and cooperating with the program.

State Responsibilities

1. Recruit, hire, supervise and cooperate in training career employees.
2. Administer cooperative program within guidelines mutually agreed upon.
3. Maintain fiscal records and provide such reports as required for federal audits.

USDA Federal Assistance Review

A report issued in Mar. 1970, "USDA Federal Assistance Review," elaborated the problems, goals, activities, and accomplishments during the first year, ending Mar. 2, 1970.

The second year report was made to the President on Apr. 2, 1971, detailing the actual accomplishments at the end of the second year of the FAR effort.

The Secretary of Agriculture, on Jan. 18, 1972, called for increased and continuing emphasis on the following objectives:

1. Greater reliance on State and local government.
2. Greater reliance on the private sector.
3. Improvement on delivery systems.

On May 25, 1972, further attention was given to coordinating and guiding agency implementation of the plan cited above.

The Action Plan elaborated in Plant and Operations Handbook No. 6, May 1972, required implementation of Secretary's Memorandum No. 1761. The Action Plan is divided into two parts. Part I is concerned with the actions necessary to expand participation by State and local governments and by the private sector in the operation of the domestic programs of the Department. Part II is concerned with the actions necessary to standardize and simplify administrative processes.

Part I provides for an ongoing effort. Progress was to extend over a period of several years. A feasibility analysis of all the programs of each agency was required to be completed within the fiscal years 1973 and 1974 to enable a totally coordinated and balanced effort, embracing all Department programs.

Part II provides for a detailed analysis of all program processes, utilizing grants, contracts or agreements so that all agency processes are examined on a four-year cycle to assure the elimination of needless red tape.

Uniform Format of Cooperative Agreement

Oct. 1, 1973, saw the agreement on a uniform format of the cooperative agreement between the Agricultural Marketing Service, USDA, and the State Departments of Agriculture pertaining to Federal-State Inspection and Grading Service. By Feb. 1, 1974, all of the States operating under the program had signed the new cooperative agreement.⁹

Insofar as the inspection and grading of dairy products are concerned, for example, in the State of Alabama, the new agreement is a revision that supersedes Cooperative Agreement No. 12-25-A-2151 effective July 1, 1951, as amended, between the Alabama Department of Agriculture and Industries, and Agricultural Extension Service, Auburn University, and the Agricultural Marketing Service. The revision was effective Feb. 1, 1974.

Federal-State Inspection and Grading and Standardization Activities Since 1963

The Dairy Division, AMS, has continued to maintain a good relationship with the several State departments of agriculture, consistent with sound

management practices, and within the framework of the applicable laws and regulations, in discharging their responsibilities in the inspection and grading of dairy products and in the function of standardization activities.

While over the years the number of cooperative agreements with the several State departments of agriculture have been shrinking, the ratio of State to Federal graders engaged in the inspection and grading of dairy products, including dairy plant inspections, has increased.

At the end of 1976, the Agricultural Marketing Service had cooperative agreements with 36 States to provide USDA inspection and grading services on manufactured dairy products and for the inspection of dairy manufacturing plants.

The extent to which States actively cooperate in providing USDA inspection and grading services within their boundaries varies greatly. Some States are signatory to the agreement but show no interest in active participation. Others participate to the extent that they have qualified staff to handle the inspection and grading responsibilities.

The following is a list of the 23 States that participate in the inspection and grading program:

Alabama	Louisiana	Ohio
Arizona	Maryland	Oklahoma ^{1/}
California ^{2/}	Massachusetts ^{1/}	Utah ^{1/}
Colorado	Michigan ^{2/}	Vermont ^{2/}
Connecticut	Montana	Virginia
Florida	New Mexico	Washington
Idaho ^{1/}	New York ^{2/}	Wyoming
Kansas ^{1/}	North Dakota ^{1/}	

1/ Conduct all of the dairy products inspection and grading services, including plant survey work, within their borders.
2/ Conduct some of the dairy plant survey work.

The following 13 States do not actively participate in the inspection and grading work:

Indiana	Oregon
Iowa	Pennsylvania
Minnesota	South Carolina
Missouri	South Dakota
Nebraska	Tennessee
New Hampshire	West Virginia
North Carolina	

The following tabulation shows the number of Federal and State dairy products graders, for the period 1953 to 1976:

<u>Year</u>	<u>Federal</u>	<u>State</u>	<u>Year</u>	<u>Federal</u>	<u>State</u>
1953	138	100	1965	147	NA
1954	203	NA	1966	105	NA
1955	242	NA	1967	157	87
1956	244	101	1968	152	98
1957	237	91	1969	152	102
1958	245	NA	1970	142	100
1959	199	91	1971	143	102
1960	177	77	1972	138	106
1961	203	104	1973	121	105
1962	252	100	1974	90	91
1963	179	113	1975	103	89
1964	154	108	1976	109	80

The Dairy Division has cooperated with the several State departments of agriculture in the development of grade standards for dairy products since 1919. The various dairy product grade standards have been discussed and reviewed with many appropriate State agricultural officials in the formative stage and in documented form as a "proposed" standard.

During the 4-year period 1959-1963, when the USDA was developing the "Minimum Standards for Milk for Manufacturing Purposes and its Production and Processing Recommended for Adoption by State Regulatory Agencies," Edward Small of the Standardization Branch held several working sessions with a committee of the Dairy Division of the National Association of State Departments of Agriculture.

The standards were updated in 1972 under the heading "Milk for Manufacturing Purposes and Its Production and Processing: Requirements Recommended for Adoption by State Regulatory Agencies." Floyd Fenton and Richard Webber worked closely with representatives of the Dairy Division of the National Association of State Departments of Agriculture in its formulation.

The State departments of agriculture were given an opportunity to contribute to the development of the frozen desserts standards. These were published in 1967 under the heading of "Recommended Standards for the Manufacture of Frozen Desserts for Adoption by State Regulatory Agencies." Floyd Fenton, Robert Anderson, and Eugene McGarrahan worked closely with representatives of the Dairy Division of NASDA in the elaboration of these standards.

During the period 1964 to 1973, Floyd Fenton worked with many State departments of agriculture, and encouraged them to enforce their laws and regulations relating to manufacturing grade milk; to update them where necessary to meet the USDA recommendations; and to adopt the "USDA Recommended Standards" where the States had no standards.

Farm visits were made in many States to obtain first-hand information as to actual milk production practices. In a few instances, assistance was given to the legislative bodies considering the adoption of the "USDA Recommended Standards."

Informal training sessions were held with State departments of agriculture personnel in various States to evaluate farm conditions from the standpoint of compliance with the requirements of the manufacturing grade milk standards.

Many talks were given by the staff of the Standardization Branch to the dairy industry within the States to help promote quality improvement of milk for manufacturing purposes through the adoption and implementation of the "USDA Recommended Standards."

The Standardization Branch, starting in 1973, through the leadership of Joseph Rubis (successor to Floyd Fenton) and the assistance of Richard Webber and Roland Golden, worked very closely and harmoniously with the several States in an effort to bring about greater acceptance of the manufacturing grade milk standards. The groundwork for the improved relations between the NASDA Dairy Division and USDA stemmed from a speech made by Rubis to NASDA in 1973. At that time he suggested that NASDA establish a permanent manufacturing milk committee to work with USDA to encourage wider State acceptance of the standards. The committee was established and as a consequence the States began moving much faster toward adoption of the standards.

To further encourage the acceptance of the standards Rubis and Webber, during the period 1973 to 1976, spoke to many industry groups explaining the requirements and interpretation of the standards. Assistance was provided in 1975 to four States (Iowa, Kansas, Oklahoma, and Oregon) in the revision of their laws and regulations pertaining to manufacturing grade milk. From 1973 to 1976, each of the 32 States which produce manufacturing grade milk had been visited by representatives of the Standardization Branch for the purpose of improving milk quality. At the close of 1976, 26 States had adopted and implemented the "USDA Recommended Standards," in whole or in part, as a result of these intensified cooperative efforts and assistance.

The Standardization Branch, with the help of NASDA, developed detailed instructions for performing farm inspections according to the "USDA Recommended Requirements for Milk for Manufacturing Purposes and Its Production and Processing for Adoption by State Regulatory Agencies," and for discussion with the several State departments of agriculture and industry. The instructions were finalized and published on Aug. 1, 1976. This document is a very helpful tool in guiding and assisting the States in the proper interpretation of farm compliance.

¹ This section was prepared from various documents related to the activities of the Committee of Government Experts on Milk and Milk Products, in the files of the Poultry and Dairy Quality Division, FSQS, USDA.

² 38 F.R. 12396.

³ G. Malcolm Trout, and Beatrice Prescott, 50 Years of the Collegiate Dairy Products Evaluation Contest: A Review, 1916-1971. Balance of section, 1972-1976, was prepared from various related documents in the files of the Poultry and Dairy Quality Division, FSQS, USDA.

⁴ This section was prepared from various documents related to the activities of the National Labeling Committee, in the files of the Poultry and Dairy Quality Division, FSQS, USDA.

⁵ 79 Stat. 1127.

⁶ This section was prepared from the records of the Office of Intergovernmental Affairs, Office of the Secretary of Agriculture and the office records of the Poultry and Dairy Quality Division, FSQS, USDA.

⁷ Office records, Administrative Services Division, FSQS, USDA.

⁸ 76 Stat. 663.

⁹ Office records, Administrative Services Division, FSQS, USDA.

SOME LEGISLATIVE ACTIONS

Until 1946, the dairy products standardization, inspection and grading programs, as well as other similar programs within USDA, were administered by virtue of authority contained in the annual appropriation acts of the Department of Agriculture. In 1946, the Research and Marketing Act was passed by Congress which directs and authorizes the Secretary of Agriculture to carry out such programs or activities. Other related actions to the standardization, inspection and grading programs were established by statute, i.e., the Federal Register Act, the Administrative Procedure Act, and the Freedom of Information Act.

THE FEDERAL REGISTER ACT

In the early 1930's, there was a communications problem between the executive agencies and the public brought about by the surge of regulatory activity. The administrative agencies needed a method for giving timely public notice of their often far-reaching requirements and programs. Record keeping and administration was essentially an agency operation until the National Archives was established in 1934.¹ Each agency kept its own records, issued its regulations, standards, and other legal documents, and the White House released its presidential orders and documents. All these were integrated into a uniform system when the Federal Register Act was approved July 26, 1935.²

This Act requires the publication of Federal proclamations, orders, regulations, notices, and other documents in the Federal Register. The first number was published Mar. 14, 1936.

THE ADMINISTRATIVE PROCEDURE ACT

The Administrative Procedure Act, approved June 11, 1946, was enacted "to improve the administration of justice by promoting fair administrative procedure."³ The 1946 measure introduced the element of public participation in the rulemaking process.

The Administrative Procedure Act requires that certain information, such as substantive rules and regulations, be made public by publication in the Federal Register under proposed rulemaking. Reference to the authority under which the rule is proposed is required. The Act requires that all interested persons be given an opportunity to present comments, views and arguments, within 30 days prior to the effective date, except as otherwise provided by the issuing agency upon good cause found and published with the rule. Every agency is required to accord any interested person the right to petition for the issuance, amendment, or repeal of a rule.

THE FREEDOM OF INFORMATION ACT

The Freedom of Information Act, which was enacted July 4, 1966, is designed to assure greater public access to Government information and records.⁴ The law became effective July 4, 1967, and amends Section 3 of the Administrative Procedure Act.

The Freedom of Information Act provides that each agency, in accordance with published rules, make available certain information for public inspection and copying.

The Consumer and Marketing Service established rules for the implementation of the requirements of the new law, and published them in the Federal Register. Under these rules, each Division of the Consumer and Marketing Service and successor agencies is required to maintain and make available for public inspection and copying a current index providing identifying information on standards, rules and regulations, staff manuals, and instructions and related matters.

A "statement of consideration" is included in every grade standard or regulation scheduled for publication in the Federal Register, which outlines the request for the standard or regulation and the historical background in its development. A "statement of consideration" reviews the comments and suggestions received and the action taken in the formulation of the standards and regulations as promulgated.

LEGISLATIVE HISTORY OF THE RESEARCH AND MARKETING ACT OF 1946

During World War II and immediately thereafter, Congress showed a renewed interest in research and marketing of agricultural products. In the Seventy-eighth Congress, the House Committee on Agriculture was authorized to make a study of the marketing of agricultural products. That authority was continued in the Seventy-ninth Congress. The study clearly brought out that practically no work had been done by the Federal Government in the field of agricultural marketing.

The committee's investigation of the marketing of farm products, pursuant to House Resolution 54, developed information that there was comparatively little data available on the costs, wastes, and inefficiencies of marketing and distributing agricultural products. Such information was fundamental in any thorough study of our marketing system. Without adequate information, no accurate analysis of the deficiencies in the distribution system could be made. Such information was required if attention was to be focused on the weak spots and if ways and means for improvement were to be developed. The committee pointed out that improved efficiency of handling agricultural products from the farm to the consumer was a continuing process which must be carried on constantly if genuine progress was to be achieved.

On May 24, 1946, Senator Bankhead introduced S. 2248, which was referred to the Senate Committee on Agriculture and Forestry. On the same day, Rep. Flannagan introduced a companion bill, H.R. 6548, which was referred to the House Committee on Agriculture. Both of these bills provided for further research into basic laws and principles relating to agriculture.

On June 6, 1946, Rep. Hope introduced H.R. 6692, which was referred to the House Committee on Agriculture. The intent of this bill was to improve and facilitate the marketing and distribution of agricultural products; improve nutritional standards; reduce the cost of distribution and increase consumption; and to promote the scientific development of improved methods of handling, transporting, storing, distributing and marketing agricultural products by establishing an Agricultural Marketing Administration to conduct all research, service and regulatory work in the field of marketing agricultural products.

The House Committee on Agriculture held hearings on June 13, 1946, based on H.R. 6548 and H.R. 6692. As a result of the hearings, these bills were amended and combined to form a clean bill, H.R. 6932. Title I of the clean bill (H.R. 6932) replaced H.R. 6548 and Title II superseded H.R. 6692. On June 29, 1946, Rep. Flannagan introduced H.R. 6932, which was referred to the Committee on Agriculture.

Title I of H.R. 6932 is an "An Act to provide for research into basic laws and principles relating to agriculture and to provide for the further development of cooperative agricultural extension work and the more complete endowment and support of land-grant colleges." The principle purpose was to provide for a greatly augmented research program with a view to enabling agriculture to attain a position in research comparable to that of other great industries.

Title II is cited as the "Agricultural Marketing Act of 1946." The principal purposes of Title II of H.R. 6932 were to promote through research, study, experimentation, and through the development of cooperation among Federal and State agencies, farm organizations, and private industries, a scientific approach to the problems of marketing, transportation, and distribution of agricultural products, so that marketing methods and facilities might be improved.

It was generally recognized and admitted that many of the major and most pressing problems in agriculture were marketing and distribution. In the past, major emphasis had been placed on problems of production, and marketing problems to a large extent had been ignored. It was also recognized that unless intensive research was carried out to improve the processes of distributing agricultural products capable of being produced in abundance, many of the benefits and improvements developed through research in the field of production would be dissipated.

Title III of H.R. 6932 provided for the establishment of a national advisory committee to consult with the Secretary of Agriculture and other appropriate officials of the Department of Agriculture and make recommendations relative to research and service work authorized by the Research and Marketing Act of 1946.

On July 8, 1946, the House Committee on Agriculture reported H.R. 6932 with amendments, along with House Report No. 2458. H.R. 6932 was debated in the House on July 15 and passed unanimously and referred to the Senate Committee on Agriculture and Forestry on July 16. On July 26, the Senate Committee reported H.R. 6932 with amendments, accompanied by Senate Report 1843.

H.R. 6932 became known as the Flannagan-Hope Research and Marketing Bill. Report No. 1843 provided that, to the maximum extent practicable, the marketing research was to be done in cooperation with the State experiment stations and such other appropriate agencies. Similar arrangements were to be provided regarding the State extension services with respect to marketing educational and demonstrational work. Information, inspection, regulatory work and other marketing services were to be done in cooperation with State agencies.

On July 29, H.R. 6932 was debated in the Senate and passed unanimously with amendments and on July 30, the House concurred in Senate amendments. H.R. 6932 is actually a composite of three bills: H.R. 6548, introduced by Flannagan of Virginia, the Chairman of the Committee of Agriculture; H.R. 295, introduced by August H. Andresen of Minn.; and H.R. 6692, introduced by Hope of Kansas. H.R. 6932 was approved Aug. 14, 1946, as Public Law 733.⁵

In approving H.R. 6932 (The Research and Marketing Act of 1946) President Harry S. Truman made the following statement:

Agricultural marketing is the means by which we get food and fiber from our farms to the consumers. Anything that increases efficiency to moving farm products to consumers is a material contribution to the nation's welfare. I note that this legislation has the support of producers, distributors and consumers, and was passed by both Houses of Congress without a dissenting vote.

I consider it a major step for the improvement of the private agricultural marketing system of our country. In addition to work by the United States Department of Agriculture, grants to States are provided as well as authority for entering into contracts with other public and private agencies to accomplish the purposes of this Act. It provides for research on all types of agricultural problems, particularly on utilization of farm products, and the improvement of marketing services. It is to research that we must attribute much of our progress on the food front as well as on the battle front during the war. Now as we move into a new period of peace, basic research and the application of results, become even more important. Our greatest peacetime agricultural problem is the efficient marketing of adequate quantities of the right kinds of foods and other farm products. The basic research provided for in this bill will help solve the problem, and will be of great value to future generations.⁶

In view of the fact that Title II, cited as the Agricultural Marketing Act of 1946, represents landmark legislation in the field of agricultural marketing, and since authority for activities of the Standardization Branch and Inspection and Grading Branch, Poultry and Dairy Quality Division, Food Safety and Quality Service, stems from Public Law 733, Title II is quoted in its entirety in Appendix D.

¹ 48 Stat. 1122.

² 49 Stat. 500.

³ 60 Stat. 237.

⁴ 80 Stat. 250.

⁵ 60 Stat. 1087.

⁶ Legislative History of the Agricultural Research and Marketing Act of 1946, Aug. 1946, 204 pp. Available at the office of Science and Education Administration, Technical Information Systems, USDA, Law Library, Wash., D.C.

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APPENDIX A

Biographies of Directors, Chiefs, Assistant Chiefs, Heads, Chemists-in-Charge and Selected Personnel

Thomas Gregory Stitts was born on a farm in Burlington, N.Y., Mar. 25, 1891. He graduated from Cornell University, where he majored in farm management. He received degrees of master of science and doctor of philosophy from the University of Minnesota, where he later served as an assistant professor in agricultural economics. Later he was a county agent in Meeker County, Minn., and a member of the Committee of Eleven that organized the Minnesota Cooperative Creameries Association (now known as Land O'Lakes, Inc.). He joined the USDA Division of Cooperative Marketing in the Bureau of Agricultural Economics, and served as an agricultural economist with the Federal Farm Board and the Farm Credit Administration. Appointed Chief of the Dairy and Poultry Branch in Sept. 1942, he served in that capacity until he resigned from USDA on May 6, 1946, to accept a top level executive post with a large milk distributing firm, H.P. Hood and Sons, Boston, Mass.

Samuel W. Tator taught at the University of Pennsylvania, and later was President of the Junior College of Commerce in New Haven, Conn. For many years he was the Federal Milk Administrator for the Boston and other New England market areas. Appointed Director of the Dairy Branch, Production and Marketing Administration on May 6, 1946, he retired on July 23, 1948.

Philip E. Nelson was born and raised on a dairy farm in Clark County, Wis. He organized a cooperative cheese factory in Douglas County, Wis., served as its Secretary-Manager, and helped to establish the Twin Ports (Duluth, Minnesota-Superior Wisconsin) Cooperative Dairy Association. For 16 years he was a member of the Wisconsin State Senate and for several of these years, was Chairman of the State Senate Committee on Agriculture. In the mid-1940's he served as Chief of the Industrial Products Division, Office of Small Business, U.S. Department of Commerce. He was Director of the Dairy Branch, PMA, from Oct. 1948 to June 1950, and transferred to the PMA as Special Assistant to Administrator on July 1, 1950.

Preston Richards, born at Keytesville, Mo., on Nov. 23, 1905, received degrees of bachelor of science and master of science in agricultural economics from the University of Missouri. He served in the Bureau of Agricultural Economics for several years during the 1930's, and was designated Special Advisor to the Administrator, Surplus Marketing Administration, in the early 1940's. In the mid-1940's he was appointed Assistant Director, Livestock Branch, Production and Marketing Administration. On June 12, 1950, he became Director of the Dairy Branch, PMA, and remained in that position until February 19, 1953. He was then appointed Assistant Administrator for Commodity Operations, Commodity Stabilization Service and reassigned as Deputy Administrator for Price Support, CSS, Apr. 7, 1955.

Edwin Michael Norton grew up in a rural community in South Dakota. He attended the Universities of Iowa and of South Dakota; he then earned a law degree at Catholic University. He held various administrative positions in the Washington offices of different Department agencies, heading the Dairy and Poultry Procurement Division of the Purchase Branch of the former Office of Supply. He served for several years with the Dairy Branch, PMA, and was its Director from Feb. 20, 1953, until Oct. 7, 1953. When he resigned from the USDA, he became Executive Secretary of the National Milk Producers Federation. He retired from the Federation in 1968, and died in 1976.

Herbert L. Forest, born in Arlington, Mass., graduated from the University of Massachusetts and studied graduate work in economics at Harvard University. Since 1934 he has been with the U.S. Department of Agriculture. Except for a period during World War II when he was head of the Lend-Lease and Foreign Requirements Division of the Office of Agricultural War Relations, he has been in dairy work. He was appointed Assistant Deputy Director of the Dairy Division, Production and Marketing Administration in 1945, Deputy Director in 1950, and Director in 1953. He continues to direct the milk order program which regulates prices to farmers for close to 65 percent of the milk sold to plants and dealers in the United States. He gave broad direction to the standardization and to the inspection and grading program.

John C. Blum, a native of Terryville, Conn., received a bachelor of science degree in agricultural economics from the University of Connecticut in 1939. He joined USDA in 1939, when he was employed as an agricultural economist in Upper Darby, Pa. He came to Washington in 1942 to work with wartime food marketing programs, and from 1944-1946 served as a Navy supply officer in the Pacific. He returned to USDA in 1946 as an economist for the Dairy Branch, PMA, where he served as Chief of the Standardization and Program Development Branch, Dairy Division, from 1954 to 1960; as Assistant Director, Dairy Division, AMS, from 1960 to 1961; and as Director of the Dairy Division, AMS, from 1961 to 1963. He was Staff Economist, Office of the Administrator, AMS, in 1963 and 1964, when he was appointed Assistant Deputy Administrator, Consumer and Marketing Service. He served as Deputy Administrator for regulatory programs from 1967 to 1974, and appointed to the position of Associate Administrator of the Agricultural Marketing Service on Mar. 21, 1974. He retired in Sept. 1975.

Alexander Swantz is a native of the state of Washington where he grew up on a dairy and poultry farm. He graduated from Washington State College, and received degrees of master of science and doctor of philosophy from the University of Minnesota. He worked in private industry, managed a wheat and beef cattle ranch, and served in the Navy during World War II. His career with the U.S. Department of Agriculture included research and service work for the Farmer Cooperative Service, 1941-1943 and 1948. He served as a research economist, AMS, 1948-1954, as a dairy marketing specialist, AMS, 1954-1956, and as a Federal Milk Market Administrator from 1956 to 1962. Appointed Deputy Director, Dairy Division, AMS, in 1962, he was Acting Director from 1963 to 1964. Staff Economist in the Office of the Administrator, Consumer and Marketing Service, 1966-1967; Assistant Deputy Administrator for Regulatory Programs, C&MS, 1967-1968; and Associate Administrator, Commodity Exchange Authority, 1968-1974.

Roy C. Potts was born May 21, 1881, on a farm near the town of Washington, Mich. He received a bachelor of science degree from Michigan Agricultural College. From 1906 to 1915 he was head of the department of dairying in the Oklahoma A&M College. He served as dairy editor of "Oklahoma Farmer-Stockman," 1912 to 1915, when he came to Washington, D.C., to take charge of the dairy project in the Office of Markets. He initiated and gave broad direction to the market news program on dairy and poultry products, and established the inspection and grading program on dairy products in 1919, and a few years later on poultry products. He sponsored the inauguration of the resident butter grading service and was the "father" of the grade labeling program for butter. He retired as head of the Dairy and Poultry Products Division, Food Distribution Administration, on May 31, 1943. In recent years he has resided in a nursing home at Winter Park, Fla., where he celebrated his 96th birthday May 21, 1977.

Henry G.F. Hamann was a native of New York State. He received a bachelor of science degree in poultry husbandry from Cornell University in 1923 and entered Government service in 1927, at San Francisco, as a poultry products grader. He was appointed regional supervisor for poultry products in 1938, and stationed at Chicago until he was transferred to the Wash., D.C. office in 1941, where he served as national supervisor until the spring of 1943. On June 1, 1943, Hamann was named Chief, Division of Dairy and Poultry Products, Dairy and Poultry Branch, Food Distribution Administration, and remained in that post until June 30, 1951, at which time the dairy and poultry activities were separated. He was appointed Chief, Inspection and Grading Branch, Poultry Division, PMA, on July 1, 1951. He retired in 1960 and died in New York State, Dec. 8, 1968, at the age of 73.

Bennett J. Ommodt was born at Argyle, Wis., Nov. 8, 1890. He attended a Dairy and Creamery Short Course at South Dakota State College in 1912. For many years he operated and managed a cooperative creamery at Flom, Minn., and was associated with Land O'Lakes Creameries, Inc. He joined the Dairy and Poultry Products Division, Bureau of Agricultural Economics in 1936, and in 1938 was appointed regional supervisor for the inspection and grading of dairy products headquartered in Los Angeles. In 1942, he was appointed national supervisor with headquarters in Wash., D.C. In 1943, he was appointed Assistant Chief, Division of Dairy and Poultry Products, Dairy and Poultry Branch. He became Chief of the Inspection and Grading Branch, Dairy Division, PMA, on July 1, 1951. He retired as of July 31, 1959.

Harold E. Meister was born in Cottonwood County, Minn., and received a bachelor of science degree in dairy manufacturing from the University of Minnesota in 1935. He was superintendent of processing operations at a Minnesota dairy plant from 1935 to 1939, and served as a Minnesota State dairy inspector for three years. In 1942, he joined the Division of Dairy and Poultry Products, Agricultural Marketing Administration, as a cheese grader, with headquarters in Chicago. He was soon appointed as regional supervisor for cheese grading operations in the Midwest area. In 1946, he transferred to the Wash., D.C., office as assistant to the Chief of the

Dairy Section, Division of Dairy and Poultry Products. He was designated as Assistant Chief of the Inspection and Grading Branch, Dairy Division, on July 1, 1951, and promoted to Chief of the Branch, in Aug. 1959. He was appointed as a Deputy Director of the Dairy Division, C&MS, in 1967, with general responsibility for the administration of the standardization, and inspection and grading activities. He retired on Dec. 31, 1976.

Edwin F. Garbe, a native of Long Island, N.Y., received a bachelor of science degree in dairy manufacturing from Iowa State University, in 1948, after serving four years in the U.S. Army. He joined the Division of Dairy and Poultry Products, Production and Marketing Administration, in the summer of 1948 and was assigned to the New York City office as a dairy products grader. In Mar. of 1955, he was appointed Assistant Regional Supervisor and was promoted to Regional Supervisor on July 1, 1958. On July 27, 1959, he was transferred to the Wash., D.C., office and designated Assistant Chief, Inspection and Grading Branch. He was promoted to Chief, Inspection and Grading Branch, on Mar. 24, 1968; he retired in 1978.

George W. Fry was born Mar. 22, 1927, at Beloit, Wis. After serving in the U.S. Navy, 1945-1946, he attended the University of Wisconsin where he received a bachelor of science degree and a master of science degree in dairy and food industries in 1950 and 1952, respectively. In 1963 he received a MBA degree in marketing from Northwestern University. He was employed in dairy plant and laboratory work for several years before joining the Dairy Division, AMS, as a chemist, at the Chicago laboratory in Jan. 1954. He established the Dairy Division laboratory at Syracuse, N.Y., in 1963 and was in charge of that operation until Sept. 1969. Then he was transferred to the Wash., D.C., office with primary responsibility for the supervision of the resident inspection and grading and quality control program and became Chief, Dairy Inspection and Grading Branch in 1978.

Robert G. Semerad was born on a farm in Elma, Iowa. He received a bachelor of science degree in dairy industry from the University of Wisconsin in 1951, after serving in the U.S. Navy, 1945-1946. He worked for the Division of Dairy and Poultry Products, Dairy Branch, in the summer of 1950 as a dry milk sampler and joined USDA after graduation. He handled plant survey work for two years before being assigned resident dairy products grader and quality control technician at Sanna Dairies, Inc., Menomonie, Wis. In July 1955, he was transferred to the Chicago Area office where he worked for 16 years with primary responsibility for the supervision of the plant survey program. Subsequently, he was transferred to the Wash., D.C., office in July 1971, with primary responsibility for the supervision of the nationwide plant survey program.

Bruce S. Mars was born at Martinsville, Ind., Sept. 5, 1898. He received a bachelor of science degree in agriculture from Purdue University in 1924. Upon graduation he held the position of buttermaker at the Detroit Creamery Company, Detroit, Mich., 1924-1925. He was first employed by the Division of Dairy and Poultry Products as a butter grader, stationed at New York City, 1925-1927. From 1927 to 1936, he was employed as a commercial butter grader,

serving most of that time with the Great Atlantic and Pacific Tea Company. He rejoined USDA as a butter grader at the New York City office in the fall of 1936, and on Oct. 1, 1937, was appointed the first regional supervisor for the grading of dairy products, headquartered at Chicago, 1937-1939. He was transferred to New York City, on Jan. 2, 1940, and became the first regional supervisor for the Eastern area. He remained in that position until his death on June 29, 1958.

Walter J. Schriver is a native of St. Martin, Minn. He attended the Dairy School (short course) at the University of Minnesota in 1926 and 1927. He was engaged in creamery work for many years and was World Champion buttermaker, 1931-1932 and Minnesota State Champion buttermaker, 1932-1933. He was employed by the Minnesota Dairy and Food Department as an inspector for three years. He entered Government service as a resident butter grader and quality control technician in 1936 and was stationed at Armour Creameries, Dubuque, Iowa. He was transferred to the Chicago office in the spring of 1940, and shortly thereafter, was appointed regional supervisor for the inspection and grading of dairy products in the Midwest area. He resigned on Aug. 1, 1942, to accept a position as manager of the Superior Cheese Company, Green Bay, Wis., and was manager of Gold Medal Dairies, Missoula, Mont., 1948-1953. He became sales manager of an automobile agency (93 Car Center) at Missoula in 1953. On June 15, 1963, was promoted to President of the agency.

Leo H. Benson was born at Amboy, Minn., on Mar. 16, 1914. He attended the Dairy School (short course) at South Dakota College in 1934. In 1935 he became manager of the dairy manufacturing plant at the College while he continued to attend dairy classes. He received his degree in dairy manufacturing in 1939. He then became manager of the Cooperative Creamery at Rapid City, S.D. On July 5, 1940, he joined the Division of Dairy and Poultry Products with headquarters in Chicago, as a butter grader. He was appointed regional supervisor in the fall of 1942. He resigned on July 1, 1946, to accept a position in procurement and sales with Golden State Ltd.'s Chicago office. On Nov. 1, 1946, he became general manager of State Brand Creameries, Mason City, Iowa. Since suffering a stroke Nov. 12, 1964, he has been engaged as a consultant to the dairy industry.

Claude L. Reiser was born at Clayton, Kans., on Mar. 6, 1905. He received a bachelor of science degree in dairy manufacturing from the Colorado Agricultural College in 1928. He was employed by the Colorado State Department of Agriculture as a dairy inspector, 1928 to 1936; and as a county extension agent, Montezuma County, Colo., 1936-1938. His Government career began in the fall of 1938, when he was assigned to the Los Angeles office. On Apr. 1, 1941, he was put in charge of the Portland, Ore., office. He was appointed regional supervisor on Aug. 1, 1947, with headquarters in San Francisco. After spending 33 years in the inspection and grading of dairy products, he retired in June 1971.

Ervin R. Bartle was born at Clark, S.D. He received a bachelor of science degree in dairy manufacturing from Iowa State College in 1932. He had many years experience in the manufacturing and processing of dairy products. In Apr. 1943, he joined the Division of Dairy and Poultry Products and was assigned to the Kansas City, Mo., office. He resigned Sept. 28, 1945, to accept a position with the Lakeside Butter Company at Minneapolis. He rejoined the Division of Dairy and Poultry Products on Dec. 1, 1948, and was stationed at Minneapolis until Oct. 1949. He was then appointed Assistant Area Supervisor with headquarters at Des Moines, Iowa, and on July 1, 1951, was appointed Area Supervisor with headquarters at Minneapolis. He retired May 31, 1971.

Reuben H. Wilson was born on a farm at Spencer, S.D., Mar. 16, 1909. He received a bachelor of science degree in dairy manufacturing from South Dakota College in 1935. He was engaged in creamery work for several years before joining the Division of Dairy and Poultry Products on May 24, 1943. He received training in Chicago and was transferred to the Philadelphia office in Oct. 1943. He was in charge of the Philadelphia office, 1945-1949, and in Oct. 1949 was appointed Assistant Regional Supervisor with headquarters at Dallas, Tex. In Aug. 1951, he was appointed Area Supervisor with headquarters at Kansas City, Mo. On Nov. 1, 1954, he became Area Supervisor at Chicago. He retired on June 30, 1973.

Donald P. Weber was born in Iowa City, Iowa, on Apr. 7, 1914. He received a bachelor of science degree in dairy manufacturing from Iowa State University in 1939. He was engaged as a laboratory assistant instructor at Iowa State University, 1939-1941, and served in the U.S. Army, 1942-1946. In the spring of 1947, he joined the Division of Dairy and Poultry Products with headquarters at Omaha, Neb., and served as a dairy products grader until 1954. He was transferred to Kansas City, Mo., on Apr. 3, 1954, serving as a supervisory dairy products grader until Mar. 27, 1955. He also served as Acting Area Supervisor, Mar. 27, 1955, to Nov. 20, 1955, and as Area Supervisor, 1955-1959. On July 27, 1959, he was transferred to New York City as Area Supervisor, 1959-1972. He retired on Jan. 15, 1972.

Harold K. Linden was born on a farm at Spring Green, Wis., on Mar. 3, 1926. He received a bachelor of science degree in dairy manufacturing from the University of Wisconsin in Jan. 1950. He was first employed by the Division of Dairy and Poultry Products in July 1950, serving as a resident grader and quality control technician at Shawano, and LaCrosse, Wis., until the fall of 1953. He operated as a dairy products grader in the western part of Wisconsin from the fall of 1953 until the spring of 1954. He was appointed State Supervisor on Apr. 1, 1954, with headquarters at Madison, and continued in that capacity through June 30, 1965. On Oct. 1, 1966, he was transferred to Minneapolis and appointed Assistant Regional Supervisor a position he held through May 29, 1971. He was appointed regional supervisor on May 30, 1971.

Roy F. Hedtke was born in Bongards, Minn., on Jan. 12, 1920. He received a bachelor of science degree in dairy manufacturing from the University of Minnesota in 1941. He was engaged as a chemist at Twin City Milk Producers Association, Minneapolis, 1941-1943, and as a bacteriologist with the Minnesota State Department of Agriculture, 1943-1944. He also served in the U.S. Army, 1945-1946. From 1946-1950 he was engaged in quality control work at creameries in Minnesota. He started with USDA in Apr. 1950, as a resident grader and quality control technician at the Producers Creamery plant, Springfield, Mo., and continued in that capacity through 1961. He was transferred to Kansas City, Mo., as a supervisory grader and remained in that position until 1966 when he was transferred to the Wash., D.C., office, with major responsibility for the supervision of the plant survey program. He was transferred to San Francisco in July 1971, as regional supervisor; a position he currently holds.

LeRoy C. Iverson was born at Spring Grove, Minn., on Aug. 2, 1929. He served in the United States Air Force, 1951-1954. He received a bachelor of science degree in dairy industry from the University of Minnesota in Dec. 1958. He joined the Inspection and Grading Branch, Dairy Division in 1959, and was assigned to the Minneapolis office. He worked as a resident grader and quality control technician at Clarkfield, Minn., 1959-1961; and at Union Center, Wis., 1961-1963. He was transferred to the Dairy Division Laboratory, Syracuse, N.Y., as assistant in-charge, 1963-1969; placed in-charge of the laboratory from Aug. 1969 until it was closed in Jan. 1972. He has since been the Eastern Regional Supervisor.

Kenneth R. Olson was born in Madison, Wis., on Oct. 21, 1928. He received a bachelor of science degree in dairy industries from the University of Minnesota, Dec. 1958. He was commercially employed for over four years, including the position of foreman of instant dry milk operations at the Kroger Company plant, Marion, Ind. He joined the Inspection and Grading Branch in June 1963, and held assignments as resident grader and quality control technician at Juneau, 1963-1966 and Astico, Wis., 1966-1967. He was transferred to the Chicago Regional Office in June 1967, with primary responsibility for the supervision of the resident programs. In July 1971, he was assigned the responsibility of supervising the plant survey program. He was appointed Assistant Regional Supervisor in June of 1972; and was designated Regional Supervisor for the Chicago area, July 1, 1973.

Orme J. Kahlenberg was born in Two Rivers, Wis., Aug. 12, 1904. He received a bachelor of science degree in poultry nutrition and dairy husbandry from the University of Wisconsin in 1927; a master of science degree from Rutgers University in 1928; and a doctor of philosophy in dairy chemistry from Cornell University in 1938. He was on the staff at Pennsylvania State College, 1930-1936; assistant in the dairy department at Cornell, 1936-1937; and research biochemist for the Borden Company, 1937-1942. He joined the Division of Dairy and Poultry Products in 1942 and was placed in charge of the Chicago Laboratory. He resigned in 1947 and became director of the research laboratory of the National Egg Products Association, Chicago, 1947-1950.

Theodore I. Hedrick received a bachelor of science degree and a master of science degree in dairy industry from Montana State University, in 1935 and 1937, respectively, and a doctor of philosophy in dairy bacteriology from Iowa State University, in 1941. He served as instructor in the Department of Dairy Industry, Montana State University, 1937-1939; assistant professor, Department of Dairy Industry, Iowa State University, 1942-1944; and director of laboratories, North Star Dairy, St. Paul, Minn., 1946-1949. He joined the Division of Dairy and Poultry Products in 1949 and was placed in-charge of the Chicago Laboratory. He resigned in early 1956 and accepted a position with Michigan State University, as an assistant professor of dairy science, 1956-1959, and professor of Food Science, 1960 until his retirement in 1976.

Jim L. Dizikes was born in Midvale, Utah, June 6, 1915. He received a bachelor of science degree in dairying from Utah State Agricultural College, Logan, in 1937; and a doctor of philosophy in dairy technology and agricultural biochemistry from Pennsylvania State University, in 1941. He joined the Division of Dairy and Poultry Products as a chemist at the Chicago Laboratory in Nov. of 1941 and resigned in Nov. of 1945. He owned and operated a commercial laboratory at Salt Lake City, Utah, 1946-1955. He was employed by the F.M. Stamper Company, Moberly, Mo., in applied research, 1955-1956. He rejoined the Department in 1956, as chemist-in-charge of the Chicago Laboratory.

Harlan J. Emery grew up on a dairy farm in Maine. He received a bachelor of science degree in dairy husbandry from the University of Maine and a master of science degree in agricultural economics from Oregon State Agricultural College. He also did graduate study in agricultural economics at the University of California. In July 1934, he joined the Dairy Branch of the Agricultural Adjustment Administration and was placed in charge of the Manufactured Dairy Products Division, Dairy and Poultry Branch, in 1943. He served as Chief of the Program Analysis and Development Division of the Dairy Branch, 1946-1953, and of the Program Analysis and Development Branch, Dairy Division, AMS, 1953. He gave broad direction to the development and revision of grade standards for dairy products from 1943 to 1953. After USDA was reorganized in 1953 from a commodity to a functional basis, his duties involved mainly the development of policies and programs for dairy price support. He retired in 1969 as Director of the Livestock and Dairy Policy Staff, Agricultural Stabilization and Conservation Service.

Clarence J. Babcock was born July 18, 1894, at Hinckley, Ohio. He received a bachelor of science degree in dairying from Ohio State University in 1916. He was a member of the Dairy Division, Bureau of Animal Industry in 1917 and served in the U.S. Army from 1918 to 1920. He returned to USDA after World War I, and was a market milk specialist with the Division of Market-Milk Investigations, BAI and the Bureau of Dairy Industry, 1920-1943. From Dec. 1943 to Oct. 1945, he served as an officer in the Sanitary Corps, assigned to the Veterinary Division, Office of Surgeon General, U.S. Army. He resumed his duties as market milk specialist with the Bureau of Dairy Industry, 1946-1947. From then until 1954 he served as Head, Dairy Standards Section, Manufactured Dairy Products Division, and Program Analysis and Development, Dairy Branch, Production and Marketing Administration. Until his death in 1958 he was a Branch Chief and Director, Dairy and Poultry Division, Foreign Agricultural Service.

D.R. Strobel received a bachelor of science degree in agriculture from Virginia Polytechnic Institute in 1940, and a master of science, teaching fellowship, from Ohio State University in 1941. He served as a U.S. Army Officer from 1941-1945 (overseas-South Pacific, 1942-1944). From 1945 to 1947 he was employed by Armour and Company in quality control and procurement of dairy and poultry products, Southeast area; and by the North Carolina Department of Agriculture, 1947-1949. His Government career began with the Dairy Standards Section, Manufactured Dairy Products Division (later renamed Program Analysis and Development Division), Dairy Branch, PMA, in Mar. 1949. He transferred to the Foreign Agricultural Service in May 1954, first as Marketing Specialist and then as Branch Chief and Deputy Director, Dairy and Poultry Division, 1954-1962. He was assigned to the American Embassy in Tokyo, Japan, as Assistant Agricultural Attaché and USDA Trade Center Manager, 1962-1965. After his tour of duty he returned to the United States and was appointed Director, Dairy and Poultry Division, FAS, 1965-1974. He has served as International Marketing Director, Dairy and Poultry, FAS from 1974 to the present.

Edward Small was born in Chicago, Ill., on Dec. 12, 1900. In 1918 he enlisted in the Boys Working Reserve, which was established to relieve the farm labor shortage during World War I. He received a bachelor of science degree in agriculture from the University of Illinois in 1923, and was subsequently engaged in Cow Testing Association work and as a dairy herdsman in Whiteside County, Ill. He started his Government career with the Division of Dairy and Poultry Products, Bureau of Agricultural Economics, on Aug. 1, 1927, with headquarters at Chicago, Ill., as a grader and market news reporter. In Feb. 1930, he was placed in charge of the Philadelphia office and on May 1, 1935, he was appointed national supervisor for the inspection and grading of dairy products. He took charge of the Chicago office on Jan. 2, 1940; served as an area supervisor for several years, and on Nov. 1, 1954, was appointed Head of the standardization work in the Program Development and Standardization Branch, Dairy Division, Wash., D.C. On July 1, 1961, he became Chief of the Standardization Branch, within the new Dairy Division, AMS. He retired from Federal service on Aug. 3, 1963.

Floyd E. Fenton was born July 16, 1906, in Orfino, Idaho. He received a bachelor of science degree in dairy manufacturing from Washington State College in 1931, and worked for several summers at the Walla Walla Dairymen's Association plant before graduating from the college. He was plant superintendent at the Inland Empire Dairy Association, Spokane, Wash., from 1931 to 1942, when he accepted a position with the Division of Dairy and Poultry Products with headquarters at Chicago. At the end of Jan. 1943, he was appointed regional supervisor for the inspection and grading of dairy products, with headquarters at San Francisco. In early 1947 he was transferred to Chicago as Midwest Regional Supervisor. He resigned on Dec. 31, 1948, to become Assistant Manager at the Inland Empire Dairy Association plant. In 1955 he returned to the USDA, accepting a position with the Program Development and Standardization Branch, Dairy Division, Wash., D.C. He became Chief of the Standardization Branch, Dairy Division, AMS, in the fall of 1963. Ten years later he retired.

Robert W. March was born in Madison, Wis., on Mar. 28, 1917. He received a bachelor of philosophy degree in economics from the University of Wisconsin in 1939. He then joined the Dairy and Poultry Branch, Agricultural Marketing Administration, Wash., D.C., in 1942, and for the next several years was engaged in wartime and immediate postwar marketing problems of dairy products. He transferred to the Program Development and Standardization Branch, Dairy Division, Agricultural Marketing Service, in 1954, and was Chief of that Branch from Apr. 12, 1960, to May 14, 1961. He subsequently became Assistant Director and then Deputy Director of the Dairy Division, AMS.

Robert F. Anderson was born in Sioux City, Iowa, Mar. 2, 1923. He received a bachelor of science degree in dairy manufacturing from Iowa State University in 1948. From 1942 to 1946 he had served in the U.S. Army Air Force as a navigator. He joined the Division of Dairy and Poultry Products as a dairy products grader at St. Louis, Mo., in 1950; two years later he was appointed resident grader and quality control technician at Neosho Valley Cooperative Creamery Association, Erie, Kans. In 1955 he was assigned to the Kansas City, Mo., office as a supervisory dairy products grader. In Dec. 1961 he was transferred to the Wash., D.C., office, and in Oct. 1963 was appointed Assistant Chief of the Standardization Branch, Dairy Division. He resigned on June 29, 1968, to become Executive Secretary of the American Butter Institute/National Cheese Institute, with headquarters in Chicago, Ill.

Eugene T. McGarrahan was born in Chicago, Ill., Oct. 8, 1928. He received a bachelor of science degree in dairy technology from the University of Illinois. From 1954-1961 he was employed in dairy products manufacturing, mainly as a plant superintendent. He joined the Inspection and Grading Branch, Dairy Division, AMS, in 1961, and was assigned to various inspection and grading activities; in 1962, he was stationed at Juneau, Wis., as a resident grader and quality control technician. In the spring 1963, he transferred to the Standardization Branch, Wash., D.C. In 1967 he transferred to the Dairy and Poultry Division, Foreign Agricultural Service, and in 1969, returned to the Standardization Branch, as Assistant Chief. In 1971, he transferred to the Federal Food and Drug Administration and is presently Chief, Dairy and Lipid Products Branch, Division of Food Technology.

Richard W. Webber was born in Omaha, Neb., Jan. 18, 1932. He received a bachelor of science degree in dairy technology from the University of Illinois, in 1953. He joined the Inspection and Grading Branch, Dairy Division, AMS, Aug. 1, 1960, as a resident grader and quality control technician. His first assignment was at the Hiawatha Valley Dairies Cooperative, Sparta, Wis.; on July 5, 1964, he was transferred to the USDA program at Rochester Dairy Cooperative, Rochester, Minn. He was transferred to Wash., D.C., on Sept. 10, 1967, as a member of the Standardization Branch, and was promoted to Assistant Chief of the Branch on July 11, 1971.

Joseph A. Rubis was born at Jackson, Minn., on Aug. 2, 1917. He received a bachelor of science degree in dairy technology from the University of Minnesota in 1939. He was employed by Fairmont Creamery, Moorhead, Minn., 1939-1941; and by Kraft Foods Company, from 1941 to 1950, and was quality

control supervisor for the Southeastern Division. He began his career with USDA at Nashville, Tenn., on Feb. 16, 1950. He was a cheese and butter grader and dry milk sampler in Tennessee until transferred to the Wash., D.C., office of the Inspection and Grading Branch, in Nov. 1951, where he assumed varying responsibilities for program development and supervision. In Feb. 1963 he was appointed an Assistant Branch Chief; in June 1973 he was promoted to Chief of the Standardization Branch, and on Jan. 31, 1977, he was promoted to Deputy Director with administrative responsibilities for the standardization and inspection and grading activities.

APPENDIX B

Chronology of USDA Marketing Agencies

Office of Markets - May 16, 1913, to June 30, 1915.
Office of Markets and Rural Organization - July 1, 1915, to June 30, 1917.
Bureau of Markets - July 1, 1917, to June 30, 1921.
Bureau of Markets and Crop Estimates - July 1, 1921, to June 30, 1922.
Bureau of Agricultural Economics - July 1, 1922, to July 6, 1939.
Agricultural Marketing Service - July 7, 1939, to Feb. 22, 1942.
Agricultural Marketing Administration - Feb. 23, 1942, to Jan. 12, 1943.
Food Distribution Administration - Jan. 13, 1943, to Jan. 20, 1944.
Office of Distribution - Jan. 21, 1944, to Dec. 31, 1944.
Office of Marketing Services - Jan. 1, 1945, to Aug. 19, 1945.
Production and Marketing Administration - Aug. 20, 1945, to Nov. 1, 1953.
Agricultural Marketing Service - Nov. 2, 1953, to Feb. 7, 1965.
Consumer and Marketing Service - Feb. 8, 1965, to Apr. 2, 1972.
Agricultural Marketing Service - Apr. 3, 1972, to Mar. 13, 1977.

Dairy Project; Dairy Inspection and Grading; and Dairy Standardization

Dairy Project

Dairy Project (Office of Markets) - Apr. 1, 1914, to June 30, 1915.
Dairy Project (Office of Markets - July 1, 1915, to June 30, 1917.
and Rural Organization)
Dairy Project (Bureau of Markets) - July 1, 1917, to June 30, 1919.

Dairy Inspection and Grading

Division of Dairy and Poultry Products - July 1, 1919, to June 30, 1921.
(Bureau of Markets)
Division of Dairy and Poultry Products - July 1, 1921, to June 30, 1922.
(Bureau of Markets and Crop Estimates)
Division of Dairy and Poultry Products - July 1, 1922, to Oct. 31, 1929.
(Bureau of Agricultural Economics)
Dairy Inspection and Grading Section, - Nov. 1, 1929, to Oct. 5, 1938.
(Division of Dairy and Poultry Products;
Bureau of Agricultural Economics)
Dairy Inspection and Grading Section, - Oct. 6, 1938, to July 6, 1939.
Division of Dairy and Poultry Products
Dairy Inspection and Grading Section, - July 7, 1939, to Feb. 22, 1942.
(Division of Dairy and Poultry Products;
Agricultural Marketing Service)
Dairy Inspection and Grading Section, - Feb. 23, 1942, to Dec. 4, 1942.
Division of Dairy and Poultry Products,
(Dairy and Poultry Branch; Agricultural
Marketing Administration)

Dairy Inspection and Grading Section - Dec. 5, 1942, to Jan.
Division of Dairy and Poultry Products,
(Dairy and Poultry Branch; Food
Distribution Administration)

Dairy Inspection and Grading Section, - Jan. 21, 1944, to Dec.
Division of Dairy and Poultry Products,
(Dairy and Poultry Branch; Office of
Food Distribution)

Dairy Inspection and Grading Section, - Jan. 1, 1945, to Aug. 19,
Division of Dairy and Poultry Products,
(Dairy and Poultry Branch; Office
of Marketing Services)

Dairy Inspection and Grading Section, - Aug. 20, 1945, to June 30, 1951.
Division of Dairy and Poultry Products,
(Dairy Branch, Production and
Marketing Administration)

Dairy Inspection and Grading Branch, - July 1, 1951, to Nov. 1, 1953.
(Dairy Division; Production and
Marketing Administration)

Dairy Inspection and Grading Branch, - Nov. 2, 1953, to Feb. 7, 1965.
(Dairy Division; Agricultural
Marketing Service)

Dairy Inspection and Grading Branch, - Feb. 8, 1965, to Apr. 2, 1972.
(Dairy Division; Consumer and
Marketing Service)

Dairy Inspection and Grading Branch, - Apr. 3, 1972, to Mar. 13, 1977.
(Dairy Division; Agricultural
Marketing Service)

Dairy Standardization

Dairy Standardization Section, Division - Nov. 1, 1929, to Oct. 5, 1938.
of Dairy and Poultry Products
(Bureau of Agricultural Economics)

Dairy Standardization Section, Division - Oct. 6, 1938, to July 6, 1939.
of Dairy and Poultry Products

Dairy Standardization Section, Division - July 7, 1939, to Feb. 22, 1942.
of Dairy and Poultry Products
(Agricultural Marketing Service)

Dairy Standardization Section, Division - Feb. 23, 1942, to Dec. 4, 1942.
of Dairy and Poultry Products, (Dairy
and Poultry Branch; Agricultural
Marketing Administration)

Dairy Standardization Section, Division - Dec. 5, 1942, to Aug. 31, 1943.
of Dairy and Poultry Products,
(Dairy and Poultry Branch; Food
Distribution Administration)

1944.

Dairy Standardization Section, Manufactured - Sept. 1, 1943, to Jan. 20, 1944.
Dairy Products Division,
(Dairy and Poultry Branch; Food
Distribution Administration)

Dairy Standardization Section, Manufactured - Jan. 21, 1944, to Dec. 31, 1944.
Dairy Products Division,
(Dairy and Poultry Branch; Office
of Distribution)

Dairy Standardization Section, Manufactured - Jan. 1, 1945, to Aug. 19, 1945.
Dairy Products Division,
(Dairy and Poultry Branch; Office
of Marketing Services)

Dairy Standardization Section, Manufactured - Aug. 20, 1945, to Dec. 31, 1949.
Dairy Products Division,
(Dairy Branch; Production and
Marketing Administration)

Dairy Standardization Section, Program - Jan. 1, 1950, to June 30, 1951.
Analysis and Development Division,
(Dairy Branch; Production and
Marketing Administration)

Dairy Standardization Section, Program - July 1, 1951, to Nov. 1, 1953.
Analysis and Development Branch,
(Dairy Division; Production and
Marketing Administration)

Dairy Standardization Section, Program - Nov. 2, 1953, to Apr. 30, 1954.
Analysis and Development Branch,
(Dairy Division, Agricultural
Marketing Service)

Dairy Standardization Section, Program - May 1, 1954, to June 30, 1961.
Development and Standardization
Branch, (Dairy Division;
Agricultural Marketing Service)

Dairy Standardization Branch, - July 1, 1961, to Feb. 7, 1965.
(Dairy Division; Agricultural
Marketing Service)

Dairy Standardization Branch, - Feb. 8, 1965, to Apr. 2, 1972.
(Dairy Division; Consumer and
Marketing Service)

Dairy Standardization Branch, - Apr. 3, 1972, to Mar. 13, 1977.
(Dairy Division; Agricultural
Marketing Service)

BUTTER GRADING CERTIFICATE

This certificate is receivable in all courts of the United States as prime facie evidence of the truth of the statements therein contained.
It does not excuse failure to comply with any applicable Federal law.

REPLACES DA 126 (1/76) WHICH MAY BE USED
UNTIL EXHAUSTED

* AS STATED BY APPLICANT

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
DAIRY DIVISION

PLANT SURVEY REPORT

Page A

APPLICANT (Name and address)

TYPE OF PLANT

MANAGER

PLANT SURVEYED (Name and address)

PURPOSE OF SURVEY

DP- 0031552
DATE
Fee:
Expense:
Lab:
Total:
USDA INSPECTOR

ITEM NO.	CODE: S - Satisfactory U - Unsatisfactory NA - Not applicable ---- - Not checked	CHECK ONE		QUALITY PROGRAM -RAW PRODUCT	RAW PRODUCT STORAGE	17 Sight - Smell Grading 18 Bacterial Testing 19 Sediment Testing 20 Abnormal Milk Testing 21 Antibiotic Testing 22 Quality Records, Farm Follow-up 23 Milk Pick-up Frequency 24 Quality - Supply Plants 25 DMCC - Commingled Milk (by USDA) 26 Coarse Sediment Screening (by USDA) 27 28 Room Construction 29 Lighting & Ventilation 30 Product Cooler 31 Silo Storage Tanks 32 Conventional Storage Tanks 33 Pumps, Pipelines, Valves 34 CIP Cleaning System 35	
		S	U				
1	Plant Driveway & Surroundings						
2	Drainage of Premises						
3	Plant Construction - Exterior						
4							
5	Room Construction						
6	Lighting & Ventilation						
7	Weigh & Drop Tank, Pump, Pipes						
8	Can Washer						
9	Condition of Producer Cans						
10	Milk Route Trucks						
11							
12	Facilities for Bulk Trucks						
13	Truck Tanks, Pumps, Fittings						
14	Plant Pumps, Pipelines, etc.						
15	Cleaning Facilities						
16							

RECOMMENDATIONS: (List by item No.)

ITEM NO.	CODE: S - Satisfactory U - Unsatisfactory N A - Not applicable --- Not checked		CHECK ONE	CHEESE MAKING ROOM	C64	Barrels, Carts, Conveyors
					S	U
PROCESSING	C36	Room Construction		CHEESE BRINE FACILITIES	C65	Cheese Vacuumizer
	C37	Lighting & Ventilation			C66	Presses
	C38	Clarifier, Separator			C67	Salt Storage & Handling
	C39	Heat-Treating or HTST Equipment			C68	Hand Washing Facilities
	C40	Heat-Treating at sec. °F			C69	Housekeeping and Pest Control
	C41	HTST sealed at sec., °F			C70	
	C42	Vacuumizer			C71	Room Construction, Lighting, Vent.
	C43	Pumps, Pipelines, Valves			C72	Brine Tanks
	C44	CIP Cleaning System			C73	Control of Brine Quality
	C45				C74	Misc. Utensils
STARTER FACILITIES	C46	Room Construction, Lighting, Vent.		CHEESE PACKAGING	C75	Cheese Drying After Brining
	C47	Media Storage & Reconstitution			C76	Room Construction
	C48	Media Heat Treating Equipment			C77	Lighting and Ventilation
	C49	Processing Vats			C78	Wrapping Table and Scale
	C50	Starter Cans or Pipelines			C79	Rindless Sealing Equip.
CHEESE MAKING ROOM	C51			CHEESE STORAGE	C80	
	C52	Room Construction			C81	Room Construction
	C53	Lighting & Ventilation			C82	Temperature Control, Air Circulation
	C54	Make vats & Agitators			C83	Pallets, Racks, Housekeeping
	C55	Drain Tables			C84	Cheese Drying, Shelves, Carts
	C56	Curd Knives, Forks, Rakes, Misc.			C85	Pest Control
	C57	Mech. Draining, Matting Equip.			C86	Room Construction, Lighting, Vent.
	C58	Draining Equip. - Large Styles			C87	Unseparated Whey Tank(s)
	C59	Whey Pans, Pump, Pipes			C88	Desludger and/or Separator
	C60	Fines Saver			C89	Pumps, Pipelines, Valves
HANDLING OF WHEY	C61	Curd Mill		HANDLING OF WHEY	C90	Whey Cream, Cooling & Tank
	C62	Mixing & Molding Equipment			C91	Handling of Press Drippings
	C63	Salting & Hooping Equipment			C92	Whey Heating or Cooling & Storage
	C64	Hoops, Forms, Press Cloths			C93	Utilization of Whey
					C94	Animal Feed Whey Handling
					C95	

RECOMMENDATIONS: (List by Item No.)

ITEM NO.	CODE: S - Satisfactory U - Unsatisfactory NA - Not Applicable --- Not checked		CHECK ONE		LABORATORY	107 Facilities & Equipment 108 Lighting & Ventilation 109 Inspectors Facilities, if Applicable	
			S	U			
STORAGE OF SUPPLIES	96 Construction, Lighting, Vent.				110		
	97 Salt, Color, Starter, Rennet, etc.				111 Employee Clothing & Sanitary Practices		
	98 Dry Ingredients & Other Supplies				112 Equip. Sanitizing Practices		
	99 Containers, Liners, Wrappers, etc.				113 Plant Water Supply		
	100 Housekeeping				114 Handling of Product Rinsings		
	101 Pesticides & Other Chemicals				115 "Cow Water" Handling		
LOCKERROOMS, RESTROOMS, AND LUNCHROOMS	102 Location & Construction of Rooms				116 Waste Disposal		
	103 Lighting & Ventilation				117 Pest Control Program		
	104 Locker & Lunch Room Facilities				118 Shop, Boiler & Utility Rooms		
	105 Restroom Facilities & Sign				119 Salmonella Surv. Samples, if Applicable		
	106 Housekeeping				120		

STATUS OF PLANT - PREVIOUS SURVEY IF ANY

DATE

STATUS OF PLANT - THIS SURVEY (Indicate products)

RECOMMENDATIONS: (List by Item No.)

AGRICULTURAL MARKETING ACT OF 1946¹

(7 U.S.C. 1621-1627)

Title II

This title may be cited as the "Agricultural Marketing Act of 1946."

SEC. 202.² The Congress hereby declares that a sound, efficient, and privately operated system for distributing and marketing agricultural products is essential to a prosperous agriculture and is indispensable to the maintenance of full employment and to the welfare, prosperity, and health of the Nation. It is further declared to be the policy of Congress to promote through research, study, experimentation, and through cooperation among Federal and State agencies, farm organizations, and private industry a scientific approach to the problems of marketing, transportation, and distribution of agricultural products similar to the scientific methods which have been utilized so successfully during the past eighty-four years in connection with the production of agricultural products so that such products capable of being produced in abundance may be marketed in an orderly manner and efficiently distributed. In order to attain these objectives, it is the intent of Congress to provide for (1) continuous research to improve the marketing, handling, storage, processing, transportation, and distribution of agricultural products; (2) cooperation among Federal and State agencies, producers, industry organizations, and others in the development and effectuation of research and marketing programs to improve the distribution processes; (3) an integrated administration of all laws enacted by Congress to aid the distribution of agricultural products through research, market aids and services, and regulatory activities, to the end that marketing methods and facilities may be improved, that distribution costs may be reduced and the price spread between the producer and consumer may be narrowed, that dietary and nutritional standards may be improved, that new and wider markets for American agricultural products may be developed, both in the United States and in other countries, with a view to making it possible for the full production of American farms to be disposed of usefully, economically, profitably, and in an orderly manner. In effectuating the purposes of this title, maximum use shall be made of existing research facilities owned or controlled by the Federal Government or by State agricultural experiment stations and of the facilities of the Federal and State extension services. To the maximum extent practicable marketing research work done hereunder in cooperation with the States shall be done in cooperation with the State agricultural experiment stations; marketing educational and demonstrational work done hereunder in cooperation with the States shall be done in cooperation with the State agricultural extension service; market information, inspection, regulatory work and other marketing service done hereunder in cooperation with the State agencies shall be done in cooperation with the State departments of agriculture, and State bureaus and departments of markets. (7 U.S.C. 1621.)

¹ Title II of the Act of August 14, 1946, 60 Stat. 1087, as amended.

² By Joint Resolution of July 3, 1964, 78 Stat. 269, as amended May 15, 1965, 79 Stat. 111, a bipartisan National Commission on Food Marketing was established. The commission is to be composed of five members of the Senate, five members of the House of Representatives and five members appointed by the President. Its duties are to study and to appraise the marketing structure of the food industry and to make reports on their findings to the President and to Congress.



SEC. 203. The Secretary of Agriculture is directed and authorized—

(a) To conduct, assist, and foster research, investigation, and experimentation to determine the best methods of processing, preparation for market, packaging, handling, transporting, storing, distributing, and marketing agricultural products: *Provided*, That the results of such research shall be made available to the public for the purpose of expanding the use of American agricultural products in such manner as the Secretary of Agriculture may determine.

(b) To determine costs of marketing agricultural products in their various forms and through the various channels and to foster and assist in the development and establishment of more efficient marketing methods (including analyses of methods and proposed methods), practices, and facilities, for the purpose of bringing about more efficient and orderly marketing, and reducing the price spread between the producer and the consumer.

(c)² To develop and improve standards of quality, condition, quantity, grade, and packaging, and recommend and demonstrate such standards in order to encourage uniformity and consistency in commercial practices.

(d) To conduct, assist, foster, and direct studies and informational programs designed to eliminate artificial barriers to the free movement of agricultural products.

(e) To foster and assist in the development of new or expanded markets (domestic and foreign) and new and expanded uses and in the moving of larger quantities of agricultural products through the private marketing system to consumers in the United States and abroad.

(f) To conduct and cooperate in consumer education for the more effective utilization and greater consumption of agricultural products: *Provided*, That no money appropriated under the authority of this Act shall be used to pay for newspaper or periodical advertising space or radio time in carrying out the purposes of this section and section 203 (e).

(g) To collect and disseminate marketing information, including adequate outlook information on a market-area basis, for the purpose of anticipating and meeting consumer requirements, aiding in the maintenance of farm income, and bringing about a balance between production and utilization of agricultural products.

(h) To inspect, certify, and identify the class, quality, quantity, and condition of agricultural products when shipped or received in interstate commerce, under such rules and regulations as the Secretary of Agriculture may prescribe, including assessment and collection of such fees as will be reasonable and as nearly as may be to cover the cost of the service rendered, to the end that agricultural products may be marketed to the best advantage, that trading may be facilitated, and that consumers may be able to obtain the quality product which they desire, except that no person shall be required to use the service authorized by this subsection. Any official certificate issued under the authority of this subsection shall be received by all officers and all courts of the United States as *prima facie* evidence of the truth of the statements therein contained. Whoever knowingly shall falsely make, issue, alter, forge, or counterfeit any official certificate, memorandum, mark, or other identification, or device

² Wool standards were previously issued under the provisions of the so-called Wool Standards Act of May 17, 1928, 45 Stat. 593 (7 U.S.C. 415-415d).

for making such mark or identification, with respect to inspection, class, grade, quality, size, quantity, or condition, issued or authorized under this section or knowingly cause or procure, or aid, assist in, or be a party to, such false making, issuing, altering, forging, or counterfeiting, or whoever knowingly shall possess without promptly notifying the Secretary of Agriculture or his representative, utter, publish, or use as true, or cause to be uttered, published, or used as true, any such falsely made, altered, forged, or counterfeited official certificate, memorandum, mark, identification, or device, or whoever knowingly represents that an agricultural product has been officially inspected or graded (by an authorized inspector or grader) under the authority of this section when such commodity has in fact not been so graded or inspected shall be fined not more than \$1,000 or imprisoned not more than one year, or both.

(i) To determine the needs and develop or assist in the development of plans for efficient facilities and methods of operating such facilities for the proper assembly, processing, transportation, storage, distribution, and handling of agricultural products.

(j) To assist in improving transportation services and facilities and in obtaining equitable and reasonable transportation rates and services and adequate transportation facilities for agricultural products and farm supplies by making complaint or petition to the Interstate Commerce Commission, the Maritime Commission, the Civil Aeronautics Board, or other Federal or State transportation regulatory body with respect to rates, charges, tariffs, practices, and services, or by working directly with individual carriers or groups of carriers.

(k) To collect, tabulate, and disseminate statistics on marketing agricultural products, including, but not restricted to statistics on market supplies, storage stocks, quantity, quality, and condition of such products in various positions in the marketing channel, utilization of such products, and shipments and unloads thereof.

(l) To develop and promulgate, for the use and at the request of any Federal agency or State, procurement standards and specifications for agricultural products, and submit such standards and specifications to such agency or State for use or adoption for procurement purposes.

(m) To conduct, assist, encourage, and promote research, investigation, and experimentation to determine the most efficient and practical means, methods, and processes for the handling, storing, preserving, protecting, processing, and distributing of agricultural commodities to the end that such commodities may be marketed in an orderly manner and to the best interest of the producers thereof.

(n) To conduct such other research and services and to perform such other activities as will facilitate the marketing, distribution, processing, and utilization of agricultural products through commercial channels. (7 U.S.C. 1622)

¹ Subsection as amended by 69 Stat. 443, which added a sentence to provide penalties for forgery or alteration of inspection certificates, unauthorized use of official grade marks or designations, and false or deceptive reference to United States grade standards or services.

² Inspection of fish, shellfish and the products thereof transferred to the Department of Commerce. See 16 U.S.C. 742(e) and Reorganization Plan 4 (23 F.R. 2304, 35 F.R. 15627), 1970.

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Sec. 204 (a) In order to conduct research and service work in connection with the preparation for market, processing, packaging, handling, storing, transporting, distributing, and marketing of agricultural products as authorized by this title, there is hereby authorized to be appropriated the following sums:

- (1) \$2,500,000 for the fiscal year ending June 30, 1947, and each subsequent fiscal year.
- (2) An additional \$2,500,000 for the fiscal year ending June 30, 1948, and each subsequent fiscal year.
- (3) An additional \$5,000,000 for the fiscal year ending June 30, 1949, and each subsequent fiscal year.
- (4) An additional \$5,000,000 for the fiscal year ending June 30, 1950, and each subsequent fiscal year.
- (5) An additional \$5,000,000 for the fiscal year ending June 30, 1951, and each subsequent fiscal year.
- (6) In addition to the foregoing, such additional funds beginning with the fiscal year ending June 30, 1952, and thereafter, as all Congress may deem necessary.

Such sums appropriated in pursuance of this title shall be in addition to, and not in substitution for, sums appropriated or otherwise made available to the Department of Agriculture.

(b) The Secretary of Agriculture is authorized to make available from such funds such sums as he may deem appropriate for allotment to State departments of agriculture, State bureaus and departments of markets, State agricultural experiment stations, and other appropriate State agencies for cooperative projects in marketing service and in marketing research to effectuate the purposes of title II of this Act: *Provided*, That no such allotment and no payment under any such allotment shall be made for any fiscal year to any State agency in excess of the amount which such State agency makes available out of its own funds for such research. The funds which State agencies are required to make available in order to qualify for such an allotment shall be in addition to any funds now available to such agencies for marketing services and for marketing research. The allotments authorized under this section shall be made to the agency or agencies best equipped and qualified to conduct the specific project to be undertaken. Such allotments shall be covered by cooperative agreements between the Secretary of Agriculture and the cooperating agency and shall include appropriate provisions for preventing duplication or overlapping of work within the State or States cooperating. Should duplication or overlapping occur subsequent to approval of a cooperative project or allotment of funds, the Secretary of Agriculture is authorized and directed to withhold unexpended balances on such projects notwithstanding the prior approval thereof. (7 U.S.C. 1623.)

SEC. 205. (a) In carrying out the provisions of title II of this Act, the Secretary of Agriculture may cooperate with other branches of the Government, State agencies, private research organizations, purchasing and consuming organizations, boards of trade, chambers of commerce, other associations of business or trade organizations, transportation and storage agencies and organizations, or other persons or corporations engaged in the production, transportation, storing, processing, marketing, and distribution of agricultural products whether operating in one or more jurisdictions. The Secretary of Agriculture shall have authority to enter into contracts and agreements under the terms of regulations promulgated by him with States and agencies of States, private firms, institutions, and individuals for the purpose of conducting research and service work,

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making and compiling reports and surveys, and carrying out other functions relating thereto when in his judgment the services or functions to be performed will be carried out more effectively, more rapidly, or at less cost than if performed by the Department of Agriculture. Contracts hereunder may be made for work to be performed within a period not more than four years from the date of any such contract, and advance, progress, or other payments may be made. The provisions of section 3648 (31 U.S.C., sec. 529) and section 3709 (41 U.S.C., sec. 5) of the Revised Statutes shall not be applicable to contracts or agreements made under the authority of this section. Any unexpended balances of appropriations obligated by contracts as authorized by this section may, notwithstanding the provisions of section 5 of the Act of June 20, 1874, as amended (31 U.S.C., sec. 713),⁴ remain upon the books of the Treasury for not more than five fiscal years before being carried to the surplus fund and covered into the Treasury. Any contract made pursuant to this section shall contain requirements making the result of such research and investigations available to the public by such means as the Secretary of Agriculture shall determine.

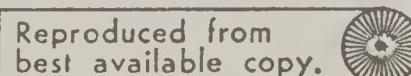
(b)⁵ The Secretary of Agriculture shall promulgate such orders, rules, and regulations as he deems necessary to carry out the provisions of this title. (7 U.S.C. 1624.)

Sec. 206. In order to facilitate administration and to increase the effectiveness of the marketing research service, and regulatory work of the Department of Agriculture to the fullest extent practicable, the Secretary of Agriculture is authorized, notwithstanding any other provisions of law, to transfer, group, coordinate, and consolidate the functions, powers, duties, and authorities of each and every agency, division, bureau, service, section, or other administrative unit in the Department of Agriculture primarily concerned with research, service, or regulatory activities in connection with the marketing, transportation, storage, processing, distribution of, or service or regulatory activities in connection with, the utilization of, agricultural products, into a single administrative agency. In making such changes as may be necessary to carry out effectively the purposes of this title, the records, property, personnel, and funds of such agencies, divisions, bureaus, services, section, or other administrative units in the Department of Agriculture affected thereby are authorized to be transferred to and used by such administrative agency to which the transfer may be made, but such unexpected balances of appropriations so transferred shall be used only for the purposes for which such appropriations were made. (7 U.S.C. 1625.)

Sec. 207. When used in this title, the term "agricultural products" includes agricultural, horticultural, viticultural, and dairy products, livestock and poultry, bees, forest products, fish and shellfish, and any products thereof, including processed and manufactured products, and any and all products raised or produced on farms and any processed or manufactured product thereof. (7 U.S.C. 1626.)

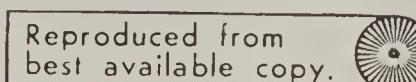
⁴ Section 713 of Title 31, referred to in subsection (a), was repealed by the Act of July 6, 1949, 63 Stat. 407.

⁵ A sentence in subsection (b) requiring the Secretary of Agriculture to include in his annual report to Congress a complete statement of research work being performed under contracts or co-operative agreements under this Act was repealed by the Act of August 30, 1954, 68 Stat. 966.



SEC. 208. The Secretary of Agriculture shall have the power to appoint, remove, and fix, in accordance with existing law, the compensation of such officers and employees, and to make such expenditures as he deems necessary, including expenditures for rent outside the District of Columbia, travel, supplies, books, equipment, and such other expenditures as may be necessary to the administration of this title: *Provided*, That the Secretary of Agriculture may appoint and fix the compensation of any technically qualified person, firm or organization by contract or otherwise on a temporary basis and for a term not to exceed six months in any fiscal year to perform research, inspection, classification, technical, or other special services, without regard to the civil-service laws or the Classification Act of 1923, as amended.⁵ (7 U.S.C. 1627.)

⁵ The Classification Act of 1923, as amended, now cited as 5 U.S.C. chapter 51 and subsection (H) of chapter 53.



APPENDIX E

Chronology of Certain Events Related to the USDA Dairy Products Standardization and Inspection and Grading Activities

- 1897 - USDA arranged for experimental shipments of butter for export to Great Britain.
- 1898 - Industrial Commission established by an act of Congress of June 18, to collect information and recommend legislation to meet the problems of agriculture, labor, and capital.
- 1901/02 - Government inspects dairy products for export, at the option of the exporter.
- 1902 - Process or renovated butter law approved May 9, required product inspection by the Meat Inspection Division, Bureau of Animal Industry.
- 1905 - The Dairy Division, BAI, at the request of the Navy Department, developed a sweet cream butter. The Navy required product and plant inspection by the Dairy Division.
- 1906 - The Dairy Division, BAI, stationed butter graders at New York and Chicago, to assist buttermakers in their quality improvement program. A similar service was extended to the San Francisco market in 1907.
- 1908 - President Theodore Roosevelt appointed his Country Life Commission, Aug. 10.
- 1912 - The Dairy Division, BAI, discontinued the market inspection program on Oct. 15.
- 1913 - U.S. Department of Agriculture, Office of the Secretary, on Jan. 2, issued Report No. 98, "Systems of Marketing Farm Products and Demand for Such Products at Trade Centers."
- 1915 - Dairy Project, Office of Markets, USDA, was established on a regular basis, Feb. 3.
- 1918 - Food Products Inspection Law (so designated for convenience) derived from certain provisions contained in an Act making appropriations for the USDA (Public Law No. 219, Oct. 1, 1918) enabled the Secretary to inaugurate butter grading service.
- 1919 - Inspection and grading service on butter was inaugurated May 28, based on grade standards and rules contained in Service and Regulatory Announcements No. 51.

- 1923 - United States standards for grades of Whole-Milk American Cheese became effective in Jan.
- 1924 - USDA resident butter grading service was inaugurated at St. Paul and Duluth, Minn., July 14.
- 1924 - Federal-State relations program for providing inspection and grading service on butter was launched, July 14.
- 1924 - Butter officially graded by USDA was merchandised with certificates of quality (grade labels) for the first time, Nov. 1.
- 1925 - The first separate set of rules and regulations governing the inspection and certification of butter, cheese and eggs were issued by the Secretary of Agriculture in Service and Regulatory Announcements No. 96, Nov. 1925. Rules and regulations for dairy products have been amended many times since, the last being in 1975.
- 1928 - The inspection program of the special Navy butter was discontinued after 1928.
- 1929 - The first national grading supervisor of dairy products to operate out of Wash., D.C., office was appointed Nov. 1.
- 1934/41 - A Memorandum of Understanding between the Federal Food and Drug Administration and the Division of Dairy and Poultry Products, BAE, was entered into Nov. 1, 1934, whereby FDA would furnish laboratory facilities at their Chicago laboratory for the testing of evaporated milk. The Understanding remained in effect until Apr. 30, 1941.
- 1935 - First group-plan grading and quality control service was inaugurated by USDA on May 1, for eight member plants of Illinois Producers Creameries, headquartered in Chicago.
- 1935 - The Federal Register Act was approved, July 26.
- 1935/43 - The USDA and the American Dry Milk Institute, Chicago, Ill., entered into a Contract of Agreement, Jan. 2, 1935, whereby ADMI would test nonfat dry milk for grade compliance. The contract for this laboratory service was terminated Dec. 31, 1943.
- 1936 - The Commodity Exchange Act was approved, June 15.
- 1936 - Keeping quality test for butter (samples incubated at 70 degrees F. and held for 7 days) was introduced informally as part of the USDA program at resident grading stations. Formally approved June 13, 1938.
- 1937 - Program of holding butter grading clinics for USDA grading personnel was inaugurated, and remains operative.

- 1937 - USDA program of placing dairy products regional supervisors at strategic locations was inaugurated, and remains operative.
- 1938 - USDA program of holding semi-annual conferences and dairy products grading clinics for regional supervisors and graders was inaugurated, and remains operative.
- 1938 - A new concept in grade standards and grading system for evaluating the quality of butter was developed by USDA, known as the "direct-method." The new grade standards were issued in tentative form, effective Apr. 1, 1938, replacing the score-card method and system of grading.
- 1939 - USDA grade standards for butter were promulgated and made effective Apr. 1. The grade standards were amended in 1943, 1954, 1960 and 1977.
- 1940 - Memorandum of Understanding signed by the Chicago Mercantile Exchange and the USDA which provided that all "appeal grading" requests on butter offered for sale on the Exchange were to be handled by USDA, effective May 1, 1940. A similar arrangement was concluded between the USDA and the New York Mercantile Exchange, effective Sept. 1, 1940.
- 1941 - USDA established its own analytical laboratory in Chicago to test various dairy products, May 1, 1941; the laboratory is still operative.
- 1941 - The Lend-Lease Act was approved, Mar. 11.
- 1941/45 - During World War II an agreement was reached between the USDA and the Veterinary Corps whereby USDA would handle "appeal grading" requests on dairy products offered for sale to the Army.
- 1942 - The USDA and the University of Washington, Seattle, Wash., entered into a Contract of Agreement whereby the latter would test various dairy products for contract compliance. The Contract of Agreement was terminated as of June 30, 1975.
- 1943 - Tentative U.S. standards for grades of American Cheddar cheese were developed and became effective in May 1943. They were a revision of the Jan. 1923 grade standards.
- 1943 - United States Tentative Grade Standards for Dried Skim Milk and Dried Whole Milk were issued and became effective May 14.
- 1943/45 - The Division of Dairy and Poultry Products graded dairy products for the Office of Price Administration.
- 1944 - The 3-A Sanitary Standards program for dairy equipment was organized and is still operative.

- 1944 - Tentative U.S. standards for grades of Swiss cheese became effective Oct. 15.
- 1945 - The Food and Agriculture Organization of the United Nations was formally organized Oct. 16.
- 1946 - The USDA and the Dairy Products Laboratory, San Francisco, entered into a Contract of Agreement, Jan. 2, whereby the latter would provide the facilities for the testing of various products. The Contract of Agreement is still operative.
- 1946 - The National School Lunch Act was approved, June 4.
- 1946 - The Administrative Procedure Act was approved June 11.
- 1946 - The Secretary of Agriculture was granted authority to conduct continuous sanitary inspection of the process butter plants and to condemn all materials intended for use in process butter which were unfit for human consumption, June 24.
- 1946 - The first USDA resident inspection service on pasteurized process cheese and related products was inaugurated on Apr. 1, 1946, at Green Bay, Wis. The general program continued through 1974.
- 1946 - Instructions governing requirements for pasteurized process cheese plants operating under USDA inspection were developed and became effective July 19.
- 1946 - Agricultural Marketing Act of 1946 was approved Aug. 14.
- 1947 - A representative of the Dairy Division, AMS, has superintended the Collegiate Dairy Products Evaluation Contest from 1947 to 1954 and from 1967 to the present time.
- 1948 - The New York Mercantile Exchange amended its rules effective Apr. 1, to provide for the acceptance of Federal butter grading certificates on all butter transactions on the Exchange.
- 1948 - The first USDA resident grading and quality control service was inaugurated on Mar. 1, at Rochester, Minn.
- 1948 - Instructions governing plants operating as official USDA plants processing and packaging dairy products became effective Dec. 1.
- 1949 - The Chicago Mercantile Exchange amended its rules effective Jan. 1, to provide for the acceptance of Federal butter grading certificates on all butter transactions on the Exchange.
- 1949 - USDA developed sediment standards for measuring sediment content in milk and milk products, Dec. 2, with accompanying visual aids.

- 1950 - USDA developed standards for measuring the scorched particle content in dry milks, replacing the "tumbler method," with accompanying visual aids. The standards became effective Mar. 3, 1951.
- 1950 - The USDA and the Tennessee State Department of Agriculture entered into a Contract of Agreement, May 29, whereby the latter tested samples of cheese relating to the purchases of cheese made by the Government. The Contract of Agreement was terminated June 30, 1956.
- 1951 - Systematic USDA inspection of dairy products manufacturing plants was inaugurated.
- 1951 - U.S. grade standards for Cheddar cheese were revised, promulgated and made effective Jan. 1.
- 1951 - U.S. grade standards for nonfat dry milk solids were amended, promulgated and made effective July 7. They superseded that part of the "Tentative U.S. Standards for Grades of Dried Skim Milk and Dried Whole Milk." The standards were amended in 1953, 1958, 1959, 1962, 1965, 1969, and 1973.
- 1951 - The Division of Dairy and Poultry Products, Dairy Branch, PMA, was separated on July 1, into two distinct entities. The two activities became branches of a newly established Dairy Division, and a Poultry Division, respectively.
- 1951 - The Inspection and Grading Branch, Dairy Division, developed a Master Contract of Agreement between USDA and the State Cooperating Agencies, in providing inspection and grading services on dairy products, effective July 1.
- 1952 - Inspection and Grading Branch developed grade labeling program on consumer-size packaged nonfat dry milk.
- 1953 - The Department of Defense, periodically, starting in 1953 assigned to the USDA certain butter grading requests. This program continued through the fifties.
- 1953 - U.S. grade standards for Swiss cheese were developed, promulgated and made effective Feb. 3. They were amended Aug. 1, 1966.
- 1953 - Memorandum of Agreement between the Production and Marketing Administration and the Food and Drug Administration was entered into May 29, whereby each agency agreed to exchange certain information.
- 1954 - U.S. grade standards for dry whey were developed and made effective July 8. They were amended as of Jan. 31, 1971.

- 1954 - The Agricultural Trade Development and Assistance Act (popular name Public Law 480) was approved July 20.
- 1955 - The 3-A Symbol Council was formed which authorized manufacturers of dairy equipment to use the 3-A Symbol on equipment conforming to the 3-A Standards.
- 1955 - The Federal Supply Service, General Services Administration, in Nov., assigned to the Dairy Division, AMS, continuing responsibility for the development of Federal Specifications covering milk and milk products.
- 1955 - The Standardization Branch, Dairy Division, developed Minimum Specifications for Approved Plants Manufacturing, Processing and Packaging Dairy Products, issued Dec. 1955.
- 1955 - Representatives of the Dairy Division, AMS, began participating in the work of 3-A Sanitary Standards.
- 1957/58 - Dairy Division, AMS, conducted a collaborative study to determine reproducibility of the direct microscopic clump count test for evaluating the quality of nonfat dry milk. A similar joint collaborative study was conducted by the Dairy Division, and the American Dry Milk Institute in 1960 and 1961.
- 1958 - The 3-A Accepted Practices program was inaugurated under the general 3-A Sanitary Standards program.
- 1958 - The Food and Agricultural Organization of the United Nations, Rome, Italy, in 1958, established the FAO Committee of Government Experts on Milk and Milk Products, and invited the United States Government as a participant.
- 1960's - The Inspection and Grading Branch, Dairy Division, had responsibility for the inspection of dairy products exported under Public Law 480 and for dockside condition inspection of the products prior to export.
- 1961 - The Inspection and Grading Branch, developed a grade labeling program on Cheddar cheese, based on superior quality and stringent quality control requirements.
- 1962/66 - The Inspection and Grading Branch, had responsibility for the inspection of dairy products under the Payment-In-Kind program.
- 1963 - U.S. grade standards for "instant" nonfat dry milk were promulgated and made effective May 1. They were amended as of Oct. 1, 1970.

- 1963 - The Standardization Branch developed "Minimum Standards for Milk for Manufacturing Purposes and Its Production and Processing Recommended for Adoption by State Regulatory Agencies." The standards were issued June 26, 1963.
- 1963 - Survey and approval of dairy products manufacturing plants became a prerequisite to obtaining USDA inspection and grading service on dairy products, effective July 1.
- 1963 - The initial publication, "Dairy Plants Surveyed and Approved for USDA Grading Service" was issued in July 1963. It is published quarterly by the Inspection and Grading Branch, Dairy Division.
- 1963 - The Agricultural Marketing Service, USDA developed standards for condition of food containers in tentative form, which became effective Aug. 8.
- 1963 - The Dairy Division, AMS, opened a branch laboratory to test dairy products at Syracuse, N.Y., in Sept.
- 1964 - Representatives of the Standardization Branch, Dairy Division, began working with members of the State Regulatory Agencies at the farm level in the proper interpretation of the farm requirements for the production of manufacturing grade milk. This project is operated on a continuing basis.
- 1964 - The Standardization Branch, Dairy Division, after two years research and testing, developed standards for measuring the sediment content in farm bulk tank milk, with accompanying visual aids. The standards were made effective May 1.
- 1964 - The Agricultural Marketing Service, USDA, developed standards for sampling plans for inspection by attributes. The standards were issued May 5.
- 1965 - USDA and the dairy industry developed "Export Butter Specifications," which were published in Feb. 1965, by the Dairy Society International and the Foreign Agricultural Service, as DSI/FAS Publication Number 31.
- 1966 - The Inspection and Grading Branch was assigned responsibility on Apr. 4, 1966, for the inspection of process butter, which at that time was manufactured by only one plant. The plant discontinued operations Aug. 26.
- 1966 - The United States Standards for Condition of Food Containers were amended, promulgated and made effective Apr. 18. The standards were further amended Nov. 1, 1971, and Nov. 1, 1976.
- 1966 - The Fair Packaging and Labeling Act was approved Nov. 3.

- 1966 - The Food for Peace Act was approved Nov. 11.
- 1967 - The Inspection and Grading Branch, Dairy Division launched a Salmonella Surveillance Program in Jan. 1967, to help pinpoint possible trouble spots in dry milk operations and take corrective action. The program is still operative.
- 1967 - Inspection responsibility for a blended food product (corn-soya-milk) was transferred from the Grain Division to the Dairy Division, C&MS, Mar. 1, 1967. The program is still operative.
- 1967 - The Standardization Branch, Dairy Division, developed "General Specifications for Dairy Plants Approved for USDA Inspection and Grading Service," which were made effective May 16, 1967.
- 1968 - Memorandum of Understanding reached on May 4, 1968, between the U.S. Public Health Service (now a part of FDA), HEW, and the Consumer and Marketing Service, USDA, concerning the issuance of standards for "instant" nonfat dry milk, and for farms producing manufacturing grade milk. USDA to be the issuing agency.
- 1968 - An informal working agreement was signed May 9, 1968, between the Consumer and Marketing Service and the Food and Drug Administration, concerning Salmonella Surveillance of dry milk plants and dry milk products. The agreement was formalized in Nov. 1970 and Dec. 1971.
- 1968 - The Standardization Branch, Dairy Division, developed Recommended Standards for the Manufacture of Frozen Desserts for Adoption by State Regulatory Agencies, which were issued June 21, 1968.
- 1968 - U.S. Standards for Grades of Edible Dry Casein (Acid) were developed, promulgated and made effective Sept. 1, 1968.
- 1969 - The Department of Defense in Sept. 1969, requested USDA inspection and grading of butter, Cheddar cheese and Swiss cheese on certain size lots. The request came about as a result of a General Accounting Office recommendation to eliminate duplication of inspection by USDA and DOD.
- 1969 - The United States Department of Agriculture and the Department of Health, Education and Welfare reached an agreement on Oct. 10, 1969, whereby it was decided that USDA would continue to develop and publish standards for manufacturing milk for State adoption and enforcement.
- 1970 - The National Environmental Policy Act of 1969 was approved, Jan. 1, 1970.
- 1970 - The Occupational Safety and Health Act of 1970 was approved, Dec. 19, 1970.

- 1970 - Membrane system developed for processing of whey, employing ultrafiltration or reverse osmosis.
- 1971 - Billings for inspection and grading services on dairy products were automated, starting July 1.
- 1971 - The responsibility for the development of Federal Specifications was reassigned to the Department of Defense in the fall of 1971.
- 1971 - United States Standards for Grades of Bulk American Cheese for Manufacturing were developed, promulgated and made effective Dec. 22, 1971.
- 1972 - Requirements for Milk for Manufacturing Purposes and Its Production and Processing Recommended for Adoption by State Regulatory Agencies were amended by USDA and issued Apr. 7, 1972.
- 1973 - United States Standards for Grades of Monterey (Monterey Jack) Cheese were developed, promulgated and made effective Jan. 15, 1973.
- 1973 - United States Standards for Grades of Colby Cheese were developed, promulgated and made effective Jan. 15, 1973.
- 1973 - A revised agreement concerning the inspection and grading of food products was entered into Aug. 28, 1973, between the Agricultural Marketing Service and the Food and Drug Administration. The original agreement had been in effect since May 29, 1953.
- 1974 - The Syracuse Laboratory, Inspection and Grading Branch, Dairy Division, discontinued operations Jan. 15, 1974.
- 1974 - Responsibility for the inspection of margarine made from vegetable oils was transferred from the Grain Division to the Inspection and Grading Branch, Dairy Division, effective June 3, 1974.
- 1974 - The Food and Drug Administration and the Agricultural Marketing Service signed an interagency agreement on June 30, whereby the Chicago laboratory of the Inspection and Grading Branch, Dairy Division would perform analysis for FDA on samples of imported dry milk products.
- 1974 - The Livestock Division, AMS, arranged for the Dairy Division, to have the Chicago laboratory of the Inspection and Grading Branch, test ground beef intended for use in the National School Lunch program, for moisture content, starting in Aug.
- 1974 - The Chicago Laboratory, Inspection and Grading Branch, Dairy Division, began testing nonfat dry milk for penicillin, in Oct.

- 1975 - Memorandum of Understanding reached Feb. 19, 1975, between the Agricultural Marketing Service and the Food and Drug Administration, to consolidate and update the Nov. 1970 and the Dec. 1971, Memorandum of Understanding, regarding salmonella surveillance of dry milk operations.
- 1975 - The Standardization Branch, Dairy Division, developed an improved visual aid (composite print) to be used in applying the scorched particle standards for dry milks. The prints have a white or light background instead of a dark reddish-brown background. The use of the prints became available in July.
- 1976 - The Standardization Branch, amended the "General Specifications for Dairy Plants Approved for USDA Inspection and Grading Service," effective Jan. 2, 1976.
- 1976 - The Standardization Branch, on Aug. 1, 1976, issued "General Instructions for Performing Farm Inspections According to the USDA Recommended Requirements for Milk for Manufacturing Purposes and Its Production and Processing for Adoption by State Regulatory Agencies.
- 1976 - The Agricultural Marketing Service, after several years of study, published AMS Handbook, "Recommended Interim Procedures for Determining Net Weights of Food Products," dated Aug. 1976.
- 1976 - The Standardization Branch on Nov. 1, 1976, issued "Guidelines for the Control of Abnormal Milk and Screening Tests for Its Detection." By July 1, 1978, the abnormal milk program will be considered by the Inspection and Grading Branch, along with other deficiencies in determining plant status.
- 1977 - The Standardization Branch, Dairy Division, developed sediment standards for milk and milk products for use with "universal" samples and accompanying visual aids. The standards became effective Sept. 1.
- 1977 - Formal acceptance by USDA, July 29, to assume management responsibilities of the Federal specifications system for food, and the management of quality assurance policies related to procurement.

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